

Final Independent External Peer Review Report Puget Sound Nearshore Ecosystem Restoration (PSNER) Draft Integrated Feasibility Report/Environmental Impact Statement (DFR/EIS)

Prepared by
Battelle Memorial Institute

Prepared for
Department of the Army
U.S. Army Corps of Engineers
National Planning Center of Expertise for Ecosystem Restoration
Mississippi Valley Division

Contract No. W912HQ-10-D-0002
Task Order: 0082

December 18, 2014

Photo credit: David Ayers, USGS

Battelle
The Business of Innovation

This page is intentionally left blank.

CONTRACT NO. W912HQ-10-D-0002
Task Order: 0082

Final Independent External Peer Review Report Puget Sound Nearshore Ecosystem Restoration (PSNER) Draft Integrated Feasibility Report/Environmental Impact Statement (DFR/EIS)

Prepared by

Battelle
505 King Avenue
Columbus, Ohio 43201

for

Department of the Army
U.S. Army Corps of Engineers
National Planning Center of Expertise for Ecosystem Restoration
Mississippi Valley Division

December 18, 2014

This page is intentionally left blank.

Final Independent External Peer Review Report Puget Sound Nearshore Ecosystem Restoration (PSNER) Draft Integrated Feasibility Report/Environmental Impact Statement (DFR/EIS)

Executive Summary

PROJECT BACKGROUND AND PURPOSE

The Puget Sound Nearshore Ecosystem Restoration (PSNER) Draft Integrated Feasibility Report/Environmental Impact Statement (DFR/EIS) is authorized under Section 209 of the River and Harbor Act of 1962 (Pub.L. 87-874) and was initiated as a U.S. Army Corps of Engineers (USACE) Civil Title 1 General Investigation study under Public Law 106-60 (29 September 1999).

The study area includes the Puget Sound, the Strait of Juan de Fuca, and southern portions of the Strait of Georgia that occur within the borders of the United States. The waters of Puget Sound receive all of the drainage from the surrounding watershed that covers more than 17,000 square miles. This watershed is collectively referred to as the Puget Sound Basin. The basin is bordered on the east by the Cascade Mountains and on the west by the Olympic Mountains. While the basin occurs largely within northwestern Washington State, two of its headwater drainages originate just across the border in Canada. The basin is roughly 80% land and 20% water. The study area shoreline has a length of nearly 2,500 miles. The total water area covers nearly 3,000 square miles at mean high water.

The Puget Sound nearshore zone provides ecologically important connections between major ecosystem types: terrestrial, freshwater, and marine. The nearshore zone includes beaches and the adjacent top of coastal banks or bluffs, the shallow waters in estuarine deltas, and tidal waters from the head of tide to a depth of approximately 10 meters. This contiguous band around the shoreline of the study area hosts diverse ecosystems that are shaped by coastal geomorphology and local environmental conditions, such as wave energy, salinity, and geology. For the purpose of this study, the study area has been divided into the following seven sub-basins based on geographic features, such as oceanographic sills and bathymetric contours, and on water flow patterns:

- Strait of Juan de Fuca
- San Juan Islands – Georgia Strait
- Hood Canal
- North Central Puget Sound
- Whidbey
- South Central Puget Sound
- South Puget Sound

Five of these sub-basins are included within the watershed area of Puget Sound proper. The other two sub-basins include areas of the Strait of Juan de Fuca and the Georgia Strait seaward to the international boundary. Four planning objectives were developed to guide the formulation of alternative plans aimed at addressing the degradation of nearshore processes and impairment of ecosystem functions in Puget Sound. These are critical factors in the declining nearshore ecosystem health of Puget Sound. The planning objectives are as follows:

1. Restore the size and quality of large river delta estuaries
2. Restore the number and quality of coastal embayments
3. Restore the size and quality of beaches
4. Increase understanding of natural process restoration in order to improve effectiveness of program actions

The study team developed four restoration strategies aligned with the PSNER planning objectives: (1) a river delta strategy, (2) a barrier embayment strategy, (3) a coastal inlet strategy, and (4) a beach strategy. These strategies informed the development of potential restoration alternatives in Puget Sound. The Tentatively Selected Plan (TSP) includes 11 sites that, taken together, address all four of the formulated strategies for process-based restoration. The TSP would restore 5,354 acres of tidally influenced wetlands and would remove 75,172 feet of stressors from the nearshore zone, restoring the natural processes that support the ecosystem structures and functions provided by wetlands, kelp and eelgrass beds, and riparian vegetation.

Independent External Peer Review Process

Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analysis. USACE is conducting an Independent External Peer Review (IEPR) of the Puget Sound Nearshore Ecosystem Restoration (PSNER) Draft Integrated Feasibility Study/Environmental Impact Statement (DFR/EIS) (hereinafter Puget Sound DFR/EIS IEPR). As a 501(c)(3) non-profit science and technology organization, Battelle is independent, is free from conflicts of interest (COIs), and meets the requirements for an Outside Eligible Organization (OEO) per guidance described in USACE (2012a). Battelle has experience in establishing and administering peer review panels for USACE and was engaged to coordinate the Puget Sound DFR/EIS IEPR. The IEPR was external to the agency and conducted following USACE and Office of Management and Budget (OMB) guidance described in USACE (2012a) and OMB (2004). This final report presents the Final Panel Comments of the IEPR Panel (the Panel). Details regarding the IEPR (including the process for selecting panel members, the panel members' biographical information and expertise, and the charge submitted to the Panel to guide its review) are presented in appendices.

Based on the technical content of the Puget Sound DFR/EIS IEPR review documents and the overall scope of the project, Battelle identified potential candidates for the Panel in the following key technical areas: Civil Works planning, environmental biology, coastal engineering, and civil engineering. Battelle screened the candidates to identify those most closely meeting the selection criteria and evaluated them for COIs and availability. USACE was given the list of final candidates to confirm that they had no COIs, but Battelle made the final selection of the four-person Panel.

The Panel received an electronic version of the 1,565-page Puget Sound DFR/EIS IEPR review documents, along with a charge that solicited comments on specific sections of the documents to be

reviewed. USACE prepared the charge questions following guidance provided in USACE (2012a) and OMB (2004), which were included in the draft and final Work Plans.

The USACE Project Delivery Team (PDT) briefed the Panel and Battelle during a kick-off meeting held via teleconference prior to the start of the review to provide the Panel an opportunity to ask questions of USACE and clarify uncertainties. Other than Battelle-facilitated teleconferences, there was no direct communication between the Panel and USACE during the peer review process. The Panel produced individual comments in response to the charge questions.

IEPR panel members reviewed the Puget Sound DFR/EIS IEPR documents individually. The panel members then met via teleconference with Battelle to review key technical comments and reach agreement on the Final Panel Comments to be provided to USACE. Each Final Panel Comment was documented using a four-part format consisting of: (1) a comment statement; (2) the basis for the comment; (3) the significance of the comment (high, medium/high, medium, medium/low, or low); and (4) recommendations on how to resolve the comment. Overall, 10 Final Panel Comments were identified and documented. Of these, one was identified as having high significance, four were identified as having medium/high significance, one had a medium significance, three had medium/low significance, and one had low significance.

Battelle received public comments from USACE on the DFR/EIS (approximately 90 total pages of comments) and provided them to the IEPR panel members. The panel members were charged with determining if any information or concerns presented in the public comments raised any additional discipline-specific technical issues with regard to the Puget Sound DFR/EIS IEPR review documents. After completing its review, the Panel identified several new issues and subsequently generated one Final Panel Comment that summarized the public concerns.

Results of the Independent External Peer Review

The panel members agreed on their “assessment of the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used” (USACE, 2012a; p. D-4) in the Puget Sound DFR/EIS IEPR review documents. Table ES-1 lists the Final Panel Comment statements by level of significance. The full text of the Final Panel Comments is presented in Section 4.2 of this report. The following summarizes the Panel’s findings.

Based on the Panel’s review, the report is well written with excellent graphics and figures that help to present the context of change and future risks to the environment. The Panel was also impressed with the number of technical supporting documents that were developed in preparation for the draft DFR/EIS over the last 10 years. The Panel did, however, identify several elements of the project that should be clarified or revised.

Engineering: Of primary concern was that the actual cost of the TSP may be higher than proposed because the concept-level design does not meet USACE requirements for estimating costs intended for Congressional authorization, and the contingency may be underestimated. USACE can resolve this issue by (1) adding a detailed discussion in the DFR/EIS addressing the validity of using concept-level designs to develop cost estimates for Congressional authorization, and (2) completing a feasibility-level design and cost estimate for one of the projects with a relatively large cost and low contingency. Another important issue is that the TSP nominally addresses beach strategy target processes by including only one project and does not appear to restore sediment supply for Puget Sound beaches at an appropriate scale. This issue can be addressed by providing a detailed description of the TSP’s effectiveness in

addressing restoration of the sediment supply to Puget Sound and explaining how the inclusion of the single beach strategy site effectively maximizes ecosystem restoration benefits and is geographically representative of the study area.

Plan Formulation: Of importance to the Panel was that justification is not provided for the assertion that the scale of the TSP is sufficient to significantly restore Puget Sound nearshore processes. This can be resolved by preparing and including an analysis defining the threshold project size necessary to generate a set of sustainable nearshore processes and addressing whether the TSP meets that threshold. The Panel also found that several concerns noted in the public comments require further analysis and documentation, most notably that (1) the only beach strategy site, Beaconsfield, is in jeopardy because the property owner's attorney disputes the DFR/EIS's claim of the landowner's willingness to provide real estate interests, and (2) the Marshland Flood Control District Natural Resources Conservation Service (NRCS) project will be impacted by the TSP without a sufficient analysis of the relationship between the two projects. These issues can be addressed by (1) discussing how to resolve the real estate issues at Beaconsfield and the impact on the beach strategy in the TSP should the Beaconsfield project not be implementable, and (2) including an acknowledgment of the existing NRCS project; discussing the legal, geotechnical (groundwater), and cost issues concerning the modification of the Marshland Flood Control District NRCS; and evaluating its impacts on the selection of the TSP.

Biology/Ecology: The Panel noted that the relationship between the input and output variables of the DFR/EIS's Ecosystem Output model and the variables used in the monitoring framework has not been identified; therefore, it may not be possible to determine if and when restoration goals are achieved. USACE can address this issue by confirming that before-after-control-impact (BACI) monitoring will be conducted; describing the current baseline conditions at each restoration site and in combination using the model; and presenting the restoration effects predicted by the model for the preferred alternative. USACE should also explain how the proposed monitoring approach and variables described in the current monitoring strategy document will be used to validate or calibrate the model.

Finally, when reviewing the Puget Sound project's public comments, the Panel noted that projects of this type and size typically include substantial public involvement and/or outreach led by USACE. Numerous public comments stated that USACE has not sufficiently communicated its goals to the public. This deficiency can be addressed by conducting more extensive outreach to involve all stakeholders and by documenting all public involvement/outreach conducted by USACE for this project in the DFR/EIS.

Table ES-1. Overview of 10 Final Panel Comments Identified by the Puget Sound DFR/EIS IEPR Panel

No.	Final Panel Comment
Significance – High	
1	The actual cost of the TSP may be higher than proposed because the concept-level design does not meet USACE requirements for estimating costs intended for Congressional authorization, and the contingency may be underestimated.
Significance – Medium/High	
2	The TSP nominally addresses beach strategy target processes by including only one project and does not appear to restore sediment supply for Puget Sound beaches at an appropriate scale.
3	Justification is not provided for the assertion that the scale of the TSP is sufficient to significantly restore Puget Sound nearshore processes.
4	Several concerns noted in the public comments could affect project cost and implementation and therefore require further analysis and documentation.
5	The relationship between the input and output variables of the Puget Sound Ecosystem Output model and the variables used in the monitoring framework has not been identified; therefore, it may not be possible to determine if and when restoration goals are achieved.
Significance – Medium	
6	The engineering analysis relies heavily on studies conducted by others which are published for flood insurance purposes and may not prove reliable for engineering, planning, and design.
Significance – Medium/Low	
7	The basis of the operation and maintenance (O&M) costs is not presented in sufficient detail to assess whether the costs have been assigned appropriately.
8	The project's effect on Federal and local maritime transportation, navigation, and facilities throughout Puget Sound is not well-acknowledged, and the associated impacts have not been quantified.
9	Ecosystem degradation has not been quantitatively defined to identify future without-project conditions.
Significance – Low	
10	The DFR/EIS includes general statements related to climate change that imply increased storm intensity, frequency, and magnitude affecting erosion of shorelines and coastal bluffs without proper reference or justification.

Table of Contents

	Page
Executive Summary	iii
1. INTRODUCTION	1
2. PURPOSE OF THE IEPR	2
3. METHODS FOR CONDUCTING THE IEPR	3
4. RESULTS OF THE IEPR	4
4.1 Summary of Final Panel Comments	4
4.2 Final Panel Comments	5
5. REFERENCES	18
 Appendix A. IEPR Process for the Puget Sound Nearshore Ecosystem Restoration DFR/EIS Project	
Appendix B. Identification and Selection of IEPR Panel Members for the Puget Sound Nearshore Ecosystem Restoration DFR/EIS Project	
Appendix C. Final Charge to the IEPR Panel as Submitted to USACE on October 16, 2014, for the Puget Sound Nearshore Ecosystem Restoration DFR/EIS Project	

List of Tables

	Page
Table ES-1. Overview of 10 Final Panel Comments Identified by the Puget Sound DFR/EIS IEPR Panel.....	vii
Table 1. Major Milestones and Deliverables of the Puget Sound DFR/EIS IEPR	3

LIST OF ACRONYMS

AFWO	Arcata Fish and Wildlife Office
ATR	Agency Technical Review
BACI	Before-After-Control-Impact
CE/ICA	Cost Effectiveness/Incremental Cost Analysis
COI	Conflict of Interest
CWRB	Civil Works Review Board
DFR/EIS	Draft Integrated Feasibility Report/Environmental Impact Statement
DrChecks	Design Review and Checking System
EC	Engineer Circular
ECB	Engineer and Construction Bulletin
EPA	U.S. Environmental Protection Agency
ER	Engineer Regulation
ERDC	Engineer Research and Development Center
FEMA	Federal Emergency Management Agency
HU	Habitat Unit
IEPR	Independent External Peer Review
NEPA	National Environmental Policy Act
NRCS	Natural Resources Conservation Service
O&M	Operation and Maintenance
OMRR&R	Operation, Maintenance, Repair, Replacement, and Rehabilitation
OEI	Outside Eligible Organization
OMB	Office of Management and Budget
PED	Preconstruction Engineering and Design
PDT	Project Delivery Team
PSNER	Puget Sound Nearshore Ecosystem Restoration
SMART	Specific, Measurable, Attainable, Risk Informed, Timely
TSP	Tentatively Selected Plan
UHCL	University of Houston-Clear Lake
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture

USFWS	U.S. Fish and Wildlife Services
WDNR	Washington Department of Natural Resources
WRDA	Water Resources Development Act

1. INTRODUCTION

The Puget Sound Nearshore Ecosystem Restoration (PSNER) Draft Integrated Feasibility Report/Environmental Impact Statement (DFR/EIS) is authorized under Section 209 of the River and Harbor Act of 1962 (Pub.L. 87-874) and was initiated as a U.S. Army Corps of Engineers (USACE) Civil Title 1 General Investigation study under Public Law 106-60 (29 September 1999).

The study area includes the Puget Sound, the Strait of Juan de Fuca, and southern portions of the Strait of Georgia that occur within the borders of the United States. The waters of Puget Sound receive all of the drainage from the surrounding watershed that covers more than 17,000 square miles. This watershed is collectively referred to as the Puget Sound Basin. The basin is bordered on the east by the Cascade Mountains and on the west by the Olympic Mountains. While the basin occurs largely within northwestern Washington State, two of its headwater drainages originate just across the border in Canada. The basin is roughly 80% land and 20% water. The study area shoreline has a length of nearly 2,500 miles. The total water area covers nearly 3,000 square miles at mean high water.

The Puget Sound nearshore zone provides ecologically important connections between major ecosystem types: terrestrial, freshwater, and marine. The nearshore zone includes beaches and the adjacent top of coastal banks or bluffs, the shallow waters in estuarine deltas, and tidal waters from the head of tide to a depth of approximately 10 meters. This contiguous band around the shoreline of the study area hosts diverse ecosystems that are shaped by coastal geomorphology and local environmental conditions, such as wave energy, salinity, and geology. For the purpose of this study, the study area has been divided into the following seven sub-basins based on geographic features, such as oceanographic sills and bathymetric contours, and on water flow patterns:

- Strait of Juan de Fuca
- San Juan Islands – Georgia Strait
- Hood Canal
- North Central Puget Sound
- Whidbey
- South Central Puget Sound
- South Puget Sound

Five of these sub-basins are included within the watershed area of Puget Sound proper. The other two sub-basins include areas of the Strait of Juan de Fuca and the Georgia Strait seaward to the international boundary. Four planning objectives were developed to guide the formulation of alternative plans aimed at addressing the degradation of nearshore processes and impairment of ecosystem functions in Puget Sound. These are critical factors in the declining nearshore ecosystem health of Puget Sound. The planning objectives are as follows:

1. Restore the size and quality of large river delta estuaries
2. Restore the number and quality of coastal embayments
3. Restore the size and quality of beaches

4. Increase understanding of natural process restoration in order to improve effectiveness of program actions

The study team developed four restoration strategies aligned with the PSNER planning objectives: (1) a river delta strategy, (2) a barrier embayment strategy, (3) a coastal inlet strategy, and (4) a beach strategy. These strategies informed the development of potential restoration alternatives in Puget Sound. The Tentatively Selected Plan (TSP) includes 11 sites that, taken together, address all four of the formulated strategies for process-based restoration. The TSP would restore 5,354 acres of tidally influenced wetlands and would remove 75,172 feet of stressors from the nearshore zone, restoring the natural processes that support the ecosystem structures and functions provided by wetlands, kelp and eelgrass beds, and riparian vegetation.

Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analysis. The objective of the work described here was to conduct an Independent External Peer Review (IEPR) of the Puget Sound Nearshore Ecosystem Restoration (PSNER) Draft Integrated Feasibility Study/Environmental Impact Statement (DFR/EIS) (hereinafter Puget Sound DFR/EIS IEPR) in accordance with procedures described in the Department of the Army, U.S. Army Corps of Engineers (USACE), Engineer Circular (EC) *Civil Works Review* (EC 1165-2-214) (USACE, 2012a) and the Office of Management and Budget (OMB) bulletin *Final Information Quality Bulletin for Peer Review* (OMB, 2004). Supplemental guidance on evaluation for conflicts of interest (COIs) was obtained from the *Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports* (The National Academies, 2003).

This final report presents the Final Panel Comments of the IEPR Panel (the Panel) on the existing engineering, environmental, and plan formulation analyses contained in the Puget Sound DFR/EIS IEPR documents (Section 4). Appendix A describes in detail how the IEPR was planned and conducted. Appendix B provides biographical information on the IEPR panel members and describes the method Battelle followed to select them. Appendix C presents the final charge to the IEPR panel members for their use during the review; the final charge was submitted to USACE on October 16, 2014.

2. PURPOSE OF THE IEPR

To ensure that USACE documents are supported by the best scientific and technical information, USACE has implemented a peer review process that uses IEPR to complement the Agency Technical Review (ATR), as described in USACE (2012a).

In general, the purpose of peer review is to strengthen the quality and credibility of the USACE decision documents in support of its Civil Works program. IEPR provides an independent assessment of the engineering, economic, environmental, and plan formulation analyses of the project study. In particular, the IEPR addresses the technical soundness of the project study's assumptions, methods, analyses, and calculations and identifies the need for additional data or analyses to make a good decision regarding implementation of alternatives and recommendations.

In this case, the IEPR of the Puget Sound DFR/EIS was conducted and managed using contract support from Battelle, which is an Outside Eligible Organization (OEO) (as defined by EC 1165-2-214). Battelle, a 501(c)(3) organization under the U.S. Internal Revenue Code, has experience conducting IEPRs for USACE.

3. METHODS FOR CONDUCTING THE IEPR

The methods used to conduct the IEPR are briefly described in this section; a detailed description can be found in Appendix A. Table 1 presents the major milestones and deliverables of the Puget Sound DFR/EIS IEPR. Due dates for milestones and deliverables are based on the award/effective date of September 29, 2014. Note that the work items listed under Task 6 occur after the submission of this report. Battelle anticipates submitting the pdf printout of the USACE's Design Review and Checking System (DrChecks) project file (the final deliverable) on February 17, 2015. The actual date for contract end will depend on the date that all activities for this IEPR, including Civil Works Review Board (CWRB) preparation and participation, are conducted.

Table 1. Major Milestones and Deliverables of the Puget Sound DFR/EIS IEPR

Task	Action	Due Date
1	Award/Effective Date	9/29/2014
	Review documents available	10/7/2014
2	Battelle submits list of selected panel members*	10/14/2014
	USACE confirms the panel members have no COI	10/16/2014
3	Battelle convenes kick-off meeting with USACE	10/6/2014
	Battelle convenes kick-off meeting with USACE and panel members	10/24/2014
4	Panel members complete their individual reviews	11/13/2014
	Panel members provide draft Final Panel Comments to Battelle	12/1/2014
	Public comments available to Battelle	12/8/2014
	Battelle sends public comments to panel members	12/9/2014
	Panel members complete their review of public comments and finalize Final Panel Comments	12/10/2014
5	Battelle submits Final IEPR Report to USACE*	12/17/2014
6 ^a	Battelle convenes Comment-Response Teleconference with panel members and USACE	1/29/2015
	Battelle submits pdf printout of DrChecks project file to USACE	2/17/2015
	CWRB Meeting (Estimated Date) ^b	9/2015
	Contract End/Delivery Date	9/28/2015

^a Task 6 occurs after the submission of this report.

^b The CWRB meeting was listed in the Performance Work Statement under Task 3 but was relocated in this schedule to reflect the chronological order of activities.

Battelle identified, screened, and selected four panel members to participate in the IEPR based on their expertise in the following disciplines: Civil Works planning, environmental biology, coastal engineering, and civil engineering. The Panel reviewed the DFR/EIS document and produced nine Final Panel

Comments in response to 53 charge questions provided by USACE for the review. The charge also included two questions added by Battelle that sought summary information from the IEPR Panel. Battelle instructed the Panel to develop the Final Panel Comments using a standardized four-part structure:

1. Comment Statement (succinct summary statement of concern)
2. Basis for Comment (details regarding the concern)
3. Significance (high, medium/high, medium, medium/low, or low; in accordance with specific criteria for determining level of significance)
4. Recommendation(s) for Resolution (at least one implementable action that could be taken to address the Final Panel Comment).

Battelle reviewed all Final Panel Comments for accuracy, adherence to USACE guidance (EC 1165-2-214, Appendix D), and completeness prior to determining that they were final and suitable for inclusion in the Final IEPR Report. There was no direct communication between the Panel and USACE during the preparation of the Final Panel Comments. The Panel's findings are summarized in Section 4.1; the Final Panel Comments are presented in full in Section 4.2.

4. RESULTS OF THE IEPR

This section presents the results of the IEPR. A summary of the Panel's findings and the full text of the Final Panel Comments are provided.

4.1 Summary of Final Panel Comments

The panel members agreed on their "assessment of the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used" (USACE, 2012a; p. D-4) in the Puget Sound DFR/EIS IEPR review documents. Table ES-1 lists the Final Panel Comment statements by level of significance. The full text of the Final Panel Comments is presented in Section 4.2 of this report. The following summarizes the Panel's findings.

Based on the Panel's review, the report is well written with excellent graphics and figures that help to present the context of change and future risks to the environment. The Panel was also impressed with the number of technical supporting documents that were developed in preparation for the draft DFR/EIS over the last 10 years. The Panel did, however, identify several elements of the project that should be clarified or revised.

Engineering: Of primary concern was that the actual cost of the TSP may be higher than proposed because the concept-level design does not meet USACE requirements for estimating costs intended for Congressional authorization, and the contingency may be underestimated. USACE can resolve this issue by (1) adding a detailed discussion in the DFR/EIS addressing the validity of using concept-level designs to develop cost estimates for Congressional authorization, and (2) completing a feasibility-level design and cost estimate for one of the projects with a relatively large cost and low contingency. Another important issue is that the TSP nominally addresses beach strategy target processes by including only one project and does not appear to restore sediment supply for Puget Sound beaches at an appropriate scale. This issue can be addressed by providing a detailed description of the TSP's effectiveness in addressing restoration of the sediment supply to Puget Sound and explaining how the inclusion of the single beach strategy site effectively maximizes ecosystem restoration benefits and is geographically representative of the study area.

Plan Formulation: Of importance to the Panel was that justification is not provided for the assertion that the scale of the TSP is sufficient to significantly restore Puget Sound nearshore processes. This can be resolved by preparing and including an analysis defining the threshold project size necessary to generate a set of sustainable nearshore processes and addressing whether the TSP meets that threshold. The Panel also found that several concerns noted in the public comments require further analysis and documentation, most notably that (1) the only beach strategy site, Beaconsfield, is in jeopardy because the property owner's attorney disputes the DFR/EIS's claim of the landowner's willingness to provide real estate interests, and (2) the Marshland Flood Control District Natural Resources Conservation Service (NRCS) project will be impacted by the TSP without a sufficient analysis of the relationship between the two projects. These issues can be addressed by (1) discussing how to resolve the real estate issues at Beaconsfield and the impact on the beach strategy in the TSP should the Beaconsfield project not be implementable, and (2) including an acknowledgment of the existing NRCS project; discussing the legal, geotechnical (groundwater), and cost issues concerning the modification of the Marshland Flood Control District NRCS; and evaluating its impacts on the selection of the TSP.

Biology/Ecology: The Panel noted that the relationship between the input and output variables of the DFR/EIS's Ecosystem Output model and the variables used in the monitoring framework has not been identified; therefore, it may not be possible to determine if and when restoration goals are achieved. USACE can address this issue by confirming that before-after-control-impact (BACI) monitoring will be conducted; describing the current baseline conditions at each restoration site and in combination using the model; and presenting the restoration effects predicted by the model for the preferred alternative. USACE should also explain how the proposed monitoring approach and variables described in the current monitoring strategy document will be used to validate or calibrate the model.

Finally, when reviewing the Puget Sound project's public comments, the Panel noted that projects of this type and size typically include substantial public involvement and/or outreach led by USACE. Numerous public comments stated that USACE has not sufficiently communicated its goals to the public. This deficiency can be addressed by conducting more extensive outreach to involve all stakeholders and by documenting all public involvement/outreach conducted by USACE for this project in the DFR/EIS.

4.2 Final Panel Comments

This section presents the full text of the Final Panel Comments prepared by the IEPR panel members.

Final Panel Comment 1

The actual cost of the TSP may be higher than proposed because the concept-level design does not meet USACE requirements for estimating costs intended for Congressional authorization, and the contingency may be underestimated.

Basis for Comment

Table 2 of USACE's Engineer Regulation (ER) 1110-2-1302 indicates that the minimum estimate classification requirement for a Feasibility Sponsor Preferred Plan is a Class 3 cost estimate (USACE, 2008). The Panel assumes that the TSP in the PSNER DFR/EIS is a proxy for the Feasibility Sponsor Preferred Plan seeking Congressional authorization. Per Table 1 of this ER, a Class 3 cost estimate is typically associated with a 10% to 40% level of project definition, which translates into feasibility-level design at minimum. However, the TSP in the DFR/EIS is based on concept-level designs, which, according to Table 1 of ER 1110-2-1302, correspond to a Class 4 cost estimate, i.e., with less project definition than Class 3 (USACE, 2008). Therefore, the baseline cost estimate of the TSP in the DFR/EIS does not meet the minimum requirements in the ER.

The Panel acknowledges that this IEPR precedes the Agency Decision Milestone and that a Feasibility-Level Analysis / Final Report Milestone (per the Specific, Measurable, Attainable, Risk Informed, Timely [SMART] feasibility study process) is planned subsequently. However, the list of future studies in Appendix B (Engineering) indicates that feasibility-level designs (that would allow development of Class 3 cost estimates) will not be advanced until Preconstruction Engineering and Design (PED) (i.e., after Congressional authorization).

In the absence of sufficient project definition to support a Class 3 cost estimate, an alternative would be to assign a conservative (high) cost contingency. By definition, however, a cost contingency is not intended to cover for items that are not included in the current project scope. Hence, it is not clear whether the cost contingency derived from cost and schedule risk analysis (CSRA) completed for each TSP project (see Appendix B) addresses the lack of required project definition (USACE, 2012b). A similar question is raised in the reference document submitted to the Panel titled *Enclosure 5: Decision Log* (specifically, in item 5.A of the "HQUSACE Policy Issues Revised TSP, 24 October 2013, NWD Responses 16 December 2013") (USACE, 2013).

The general concern is that by shifting so much of the analysis to the PED, the cost of the TSP may not meet the Water Resources Development Act (WRDA) 1986 Section 902 limitations. This concern is more justified when dealing with the type of projects (in the TSP) for which long-term success is not necessarily assured. In other words, it raises a question about the availability of the necessary funds (from both USACE and the non-Federal sponsor) to implement the TSP over an anticipated period of about 20 years. Furthermore, if the contingency for some of the TSP projects with the greatest cost is lower than needed (Dugall Bay at 21%, Telegraph Slough at 23%, and Nooksack at 26%, with a combined cost that represents close to 60% of the TSP cost), it calls into question the basis for the ordering of projects in the incremental cost analysis.

Significance – High

If the contingency assigned to some of the TSP projects with the greatest cost is insufficient to account for

the lack of definition in the DFR/EIS's concept-level designs, the total cost of the TSP could exceed the WRDA 1986 Section 902 limitations.

Recommendations for Resolution

1. Include in the main report of the DFR/EIS an extended discussion about the validity of using concept-level designs to develop cost estimates for Congressional authorization. So far, the greatest detail is provided in Enclosure 5 (coordination with, and review by Vertical Team), but that is a reference document, not a review document.
2. Complete a feasibility-level design and cost estimate for one of the projects with a relatively large cost and low contingency in order to provide some evidence that the CSRA risk register conducted has been adequate and on target for all 11 TSP projects.

Literature Cited:

USACE (2008). Civil Works Cost Engineering. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. Engineer Regulation (ER) No. 1110-2-1302. September 15, 2008.

USACE (2012b). Engineering Within the Planning Modernization Paradigm. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. Engineering and Construction Bulletin (ECB) No. 2012-18. May 18, 2012.

USACE (2013). Enclosure 5: Decision Log. "Puget Sound Nearshore Ecosystem Restoration (PSNER) Study, HQUSACE Policy Issues Revised TSP, 24 October 2013, NWD Responses 16 December 2013," Item 5.A, Level of Detail. Department of the Army, U.S. Army Corps of Engineers.

Final Panel Comment 2

The TSP nominally addresses beach strategy target processes by including only one project and does not appear to restore sediment supply for Puget Sound beaches at an appropriate scale.

Basis for Comment

According to the PSNER DFR/EIS, erosion from coastal bluffs supplies approximately 90% of the sediment to Puget Sound beaches, and of those coastal bluffs, 33% are armored. Although the DFR/EIS implies that additional armoring is expected to occur in response to sea level rise, a future increase in armoring (stressor) is unquantified.

The TSP (Alternative 2) includes one site (Beaconsfield Feeder Bluff) that addresses the beach strategy target processes. The inclusion of this one project site at a location isolated (in terms of sediment transport processes) from all other restoration sites would likely be ineffective in addressing shoreline armoring and future beach sediment supply at a scale appropriate for Puget Sound restoration.

Alternative 3 includes an additional beach strategy project (Washington Department of Natural Resources [WDNR] Budd Inlet beach). The comparison of alternatives (Section 5.1.1.3) states that a second beach restoration site is a rare opportunity for restoration in Puget Sound. If this is indeed the case, it would seem that every effort should be made to include an additional beach project in the TSP. The Panel acknowledges that the incremental cost per Habitat Unit (HU) is higher for the WDNR Budd Inlet site (and other beach sites in general). However, it may simply be the case that beach sites are more incrementally expensive per HU. If beach processes restoration is an important goal of Puget Sound restoration, then more funding may be required to effectively address these physical processes. It is noted that beach strategy projects appear to have relatively low total cost compared to most other strategies.

Significance – Medium/High

The natural processes goal of supplying sediment to the beaches may not be realized because the one project site included has a relatively short length compared to Puget Sound and is in a location where it will be ineffective in meeting this goal.

Recommendations for Resolution

1. Provide a detailed description of the TSP's effectiveness in addressing restoration of sediment supply to Puget Sound.
2. Explain how the inclusion of the single beach strategy site effectively maximizes ecosystem restoration benefits and is geographically representative of the study area.

Final Panel Comment 3

Justification is not provided for the assertion that the scale of the TSP is sufficient to significantly restore Puget Sound nearshore processes.

Basis for Comment

The Panel is not convinced that the scale of the project is sufficiently large to provide meaningful and sustainable restoration to the Puget Sound. The DFR/EIS recommends implementation of restoration actions at 11 selected sites, which represent a small percentage of shoreline throughout the very large Puget Sound. One of the stated goals of the project is to restore and protect nearshore processes that sustain the Sound's ecological health. To that end, the TSP is to restore 7,380 acres of estuarine habitat. To encompass the requisite habitat types, the 11 sites include seven river deltas, one coastal inlet, two barrier embayments, and one beach system. These 11 localized sites are found along a shoreline of about 2,500 miles. The benefits of the project are tied to the localized nearshore restoration processes. These limited sites constitute the future without-project condition.

USACE has concluded that the degradation of the nearshore processes is a problem of national significance. Its stated planning objective is to restore the physiographic processes that sustain the Puget Sound nearshore ecosystem and associated diverse nationally and regionally significant resources. This implies that there are some threshold nearshore processes that have to be achieved and maintained to increase targeted species within and throughout Puget Sound.

The vastness of the Puget Sound nearshore environment is confirmed in the DFR/EIS, which notes that over 500 potential restoration sites were reviewed. Through application of cost effectiveness/incremental cost analysis (CE/ICA), the number of sites became significantly reduced. While this process has merit, there was never a discussion of the threshold scale needed to achieve a degradation reversal and provide sustainable nearshore processes to significantly restore ecosystems of the Puget Sound versus localized sites.

The need for the proposed action comes from recognizing that valuable natural resources in Puget Sound have declined to a point that the ecosystem may no longer be self-sustaining without immediate intervention to curtail significant ecological degradation. What is missing is evidence, from calculations or refereed literature, that the TSP would achieve the necessary scale to effectively constitute the nearshore processes, future with-project condition.

Significance – Medium/High

If the scale of restoration is not sufficient to offset continued degradation in the rest of Puget Sound or withstand the effects of episodic events, the goals of the project will not be achieved.

Recommendations for Resolution

1. Prepare and include an analysis defining the threshold project size necessary to generate a set of sustainable nearshore processes and address whether the TSP meets that threshold.

Final Panel Comment 4

Several concerns noted in the public comments could affect project cost and implementation and therefore require further analysis and documentation.

Basis for Comment

During review of the public comments, the Panel found that some concerns raised by agencies, stakeholders, and members of the public deserve further investigation and documentation within the DFR/EIS. The most significant technical concerns identified by the public are summarized below. The Panel notes, however, that the public comments should be directly examined regarding the details of each concern. Concerns of note include:

1. The only beach strategy site, Beaconsfield, is in jeopardy because the property owner's attorney disputes the DFR/EIS's claim of willingness of the landowner to provide real estate interests. (Van Ness Feldman LLP, 2014)
2. The Marshland Flood Control District's Natural Resources Conservation Service (NRCS) project will be impacted by the TSP without a sufficient analysis of the relationship between the two projects. (NRCS, 2014)

Other concerns noted by the public parallel some of the Panel's concerns identified during its IEPR and documented in Final Panel Comments (see, for example, Final Panel Comments 1 and 3).

Significance – Medium/High

By addressing concerns raised throughout the public comments, the DFR/EIS will be more complete and will analyze issues that could impact project cost and implementation.

Recommendations for Resolution

1. Discuss how to resolve the Van Ness Feldman LLP letter (Van Ness Feldman LLP, 2014) with regard to real estate issues at Beaconsfield, and analyze the impact on the beach strategy in the TSP should the Beaconsfield project not be implementable.
2. Include an acknowledgment of the existing NRCS project; discuss the legal, geotechnical (groundwater), and cost issues concerning the modification of the Marshland Flood Control District NRCS; and analyze the Marshland project's impacts on the selection of the TSP (NSRC, 2014).

Literature Cited:

Van Ness Feldman LLP (2014). Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) - Beaconsfield Project. Correspondence from Brent Carson, Van Ness Feldman LLP, Seattle Washington. Submitted via the Puget Sound Nearshore Ecosystem Restoration Project public comment process to the U.S. Army Corps of Engineers, November 21, 2014.

NRCS (2014). Comments to the Draft Feasibility Report, Environmental Impact Statement - Puget Sound Near Shore Restoration Study. Correspondence from Roylene Rides-At-The-Door, U.S. Department of Agriculture, Natural Resources Conservation Service. Submitted via the Puget Sound Nearshore Ecosystem Restoration Project public comment process to the U.S. Army Corps of Engineers, November 21, 2014.

Final Panel Comment 5

The relationship between the input and output variables of the Puget Sound Ecosystem Output model and the variables used in the monitoring framework has not been identified; therefore, it may not be possible to determine if and when restoration goals are achieved.

Basis for Comment

The ability to determine whether a restoration project actually achieves the stated goals of restoration will be determined through the implementation of the monitoring framework in Appendix E (referenced in Section 6.6 of the DFR/EIS), where the concept of “effectiveness monitoring” is described. Although the monitoring framework recognizes the need to collect baseline data, it is unclear whether this will actually be required at each project/restoration site. The report instead seems to emphasize the use of control sites, while acknowledging the superior strengths of the BACI approach. This approach requires monitoring conditions both before a project action (to describe baseline conditions) and afterward (to determine changes associated with an action). The DFR/EIS does not explicitly state and require the collection of pre-project baseline data for calibration and verification of the Ecosystem Output model’s initial conditions and for comparison to future realized restoration trajectories at the site. The Panel does, however, acknowledge that at some sites, the current desired habitat or processes may be either absent or present at a low level (e.g., isolated land and tidal exchange). In these cases, the “baseline condition,” in terms of desired processes, may be essentially zero.

If all of the 11 projects attain their respective restoration goals (e.g., restoring natural processes and associated attributes of the target ecosystem), the implication is that the results predicted by the Ecosystem Output model (Appendix G), which were used to describe the ecological benefits from these projects, will also be attained or exceeded. Because the model is the primary tool used by the DFR/EIS to predict benefits from the restoration project, it would be beneficial to compare observed monitoring results with the predicted values generated by the model to determine if restoration goals have been achieved. In order to facilitate these comparisons, it is necessary to be able to convert variables used in the monitoring framework to the model’s input and output variables. The Panel was not able to identify a table or cross reference between the variables recommended for monitoring in Appendix E and the input and output variables used in the model.

It is equally important that monitoring indicators and variables translate into the input and output variables used in the model to predict the outcome and benefits of the proposed restoration strategies. The current variables listed within the monitoring framework seem reasonable for evaluating the four restoration strategies. However, the Panel is less certain that these variables can be converted into the variables and functions used in the model. The ability to compare the observed variables from monitoring and the predicted values of the variables generated by the model would be necessary during the adaptive management process for validation and calibration.

Significance – Medium/High

It is essential to determine if predicted outcomes were actually accomplished to determine the overall success of Puget Sound nearshore restoration projects.

Recommendations for Resolution

1. Add or modify language in the DFR/EIS and in Appendix E, Monitoring Framework, clearly stating that BACI monitoring will be conducted.
2. Ensure that variables selected for monitoring are translatable and compatible with the model input and

output variables to facilitate accurate comparisons of predicted versus observed restoration strategy results. This includes important processes, structure, and functions. This approach should also promote passive adaptive management as needed.

3. Describe the current baseline conditions at each restoration site and in combination using the model. At a minimum, this description should be incorporated in Section 4.6 for individual sites and summarized in Section 4.7 within a table. Summary information could also be provided in Section 6 for the 11 selected sites under the TSP.
4. Describe the predicted restoration effects based on the Ecosystem Output model for the TSP. At a minimum, incorporate the predicted restoration effects already described for the preferred alternative into Section 4.6 for individual sites, and summarize them in Section 4.7 within a table. Summary information could also be provided in Section 6 for the 11 selected sites under the TSP.
5. Describe the restoration effects predicted by the model for the Alternative 3 scenario. At a minimum, incorporate the description in Section 4.6 for individual sites and summarize the effects in Section 4.7 within a table.
6. Explain how the proposed monitoring approach and variables described in the current monitoring strategy will be used to validate or calibrate the model. This explanation should include information on how variables selected for monitoring will be converted if needed and used to compare the actual processes and conditions observed during monitoring with the model's predicted conditions. A section within the Monitoring Strategy Document could be added that describes this process or approach.

Final Panel Comment 6

The engineering analysis relies heavily on studies conducted by others which are published for flood insurance purposes and may not prove reliable for engineering, planning, and design.

Basis for Comment

Very few detailed engineering analyses of coastal flooding were performed for the DFR/EIS. Instead, with few exceptions, Federal Emergency Management Agency (FEMA) flood insurance studies, FEMA flood insurance rate maps, and other studies prepared by non-USACE agencies for other purposes are typically referenced.

Some of the FEMA studies referenced were draft (not complete and accepted), while others were older FEMA studies not conducted in the project area (Section 4, page 6, of Appendix B). Therefore, these referenced studies may not be reliable. In one case at the Deepwater Slough project site, two differently dated FEMA studies and maps are referenced from 2009 and 1985 (see Section 2, page 6, of Appendix B). It is unusual that both studies are referenced for the Deepwater Slough site; it implies that neither is reliable or only partly reliable.

Where base flood elevations estimated by USACE for the project are compared in the DFR/EIS to water levels estimated by others (Deer Harbor Estuary project, Section 3, page 4 of Appendix B), USACE notes a rather large discrepancy. This calls into question whether the study relies too heavily upon analyses conducted by others not associated with the project and not validated for use on the project. Without validation of the referenced studies, the risk of flooding due to proposed project activities cannot be evaluated with confidence. As a result, flooding risk and potential project costs to address flooding issues may be underestimated.

Significance – Medium

Flooding risk is significant and an accurate understanding of flood risk is critical to estimating project cost and performing design. Without validation of outside studies relied upon for the project, the risk level may not be appropriately addressed.

Recommendations for Resolution

1. Document and validate coastal flooding levels from FEMA based upon independent analysis in a manner similar to river discharge frequency tables that were provided.
2. Explain why it is appropriate to use FEMA studies to estimate coastal flooding levels for each site rather than performing analyses when using FEMA studies.
3. Resolve discrepancies between USACE base flood elevation analyses and analyses conducted by others.

Final Panel Comment 7

The basis of the operation and maintenance (O&M) costs is not presented in sufficient detail to assess whether the costs have been assigned appropriately.

Basis for Comment

Appendix I (Economics) states that “...no ongoing O&M costs are directly associated with the restoration activities planned for the sites. Instead there will be a change in O&M costs associated with other site features, such as changes to transportation infrastructure. These changes to O&M are captured in the average annual O&M estimate.” (Section 2.2.2, page 10)

Some details about the basis for the changes that have been considered are provided in the project descriptions in Appendix B (Engineering); however, only the change, but not the total O&M cost, is presented. Therefore, the Panel cannot assess whether the O&M cost estimate is appropriate.

Furthermore, Appendix B indicates that “At the current level of site design, all O&M activities have not been identified. Additional assessment of O&M activities will be conducted during PED.” (Section 2-15, page 26)

There is no qualification regarding whether the additional O&M costs will be small or large, which raises a question about its impact on the total project cost.

Although operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) does not appear to be a major factor, it would be worthwhile to clarify in more detail the reasons for assuming that future O&M costs charged to the TSP are only incremental (with respect to current), not the total O&M costs that would be required to ensure the intended long-term performance of the projects in restoring natural processes.

Significance – Medium/Low

A clear and complete description of the basis of O&M costs is necessary to determine its reasonableness.

Recommendations for Resolution

1. Provide more extensive documentation of what has been considered for O&M costs.
2. Explain the meaning of change in O&M cost (Appendix B and Appendix I) with regard to the overall goal of restoring natural processes.

Final Panel Comment 8

The project's effect on Federal and local maritime transportation, navigation, and facilities throughout Puget Sound is not well-acknowledged, and the associated impacts have not been quantified.

Basis for Comment

Because the proposed Puget Sound ecosystem restoration under the TSP involves restoring sediment supply at some of the sites, these projected changes to sediment transport could affect local and/or Federal navigation channels. While acknowledging the potential impact at two sites, Everett Marshland and Telegraph Slough, the DFR/EIS did not provide maps or a detailed analysis of potential impacts of the TSP upon existing permitted and authorized Federal navigation projects or other navigation facilities.

Although sufficient information to analyze or assess the methods, models, or analyses is not available, the Panel anticipates that the small scale of these sites would likely not contribute significantly to shoaling within permitted and authorized navigation channels.

Significance – Medium/Low

Commercial and recreational navigation represents significant industries and resources in the region that could be affected by potential shoaling.

Recommendations for Resolution

1. Identify Federal navigation projects and Federal navigation facilities (e.g., Naval bases) within the study area and provide maps with the locations of Federal navigation channels, ferry routes, and any marinas and permitted channels in the vicinity of proposed project sites.
2. Address whether proposed modifications to the nearshore processes will impact permitted and/or authorized navigation channels and berthing areas by increasing accretion within them.

Final Panel Comment 9

Ecosystem degradation has not been quantitatively defined to identify future without-project conditions.

Basis for Comment

The Panel agrees with the assumption stated in the DFR/EIS that degradation of the Puget Sound nearshore ecosystem will continue and that the rate of degradation will likely increase in the future, but current rates have been assumed to be on the conservative side. Beyond this general statement that degradation will continue, there is no definition of what is meant by degradation (water quality, habitat, endangered species), nor are future without project conditions defined in more quantitative terms (i.e., loss of HUs) . Consequently, it is difficult to quantify whether the overall impact of the TSP projects will counterbalance this negative trend.

Significance – Medium/Low

If the future without project conditions are not characterized in more quantitative terms, it is not possible to measure the actual net benefit from the TSP projects.

Recommendations for Resolution

1. Provide an estimate of HUs that will be lost under assumed future without project conditions, and compare the estimated loss against HUs that would be gained by implementing TSP projects.

Final Panel Comment 10

The DFR/EIS includes general statements related to climate change that imply increased storm intensity, frequency, and magnitude affecting erosion of shorelines and coastal bluffs without proper reference or justification.

Basis for Comment

Increased storm intensity, frequency, and magnitude are mentioned in the report (pages 34, 88, 102, and 107) and are cited to cause additional bluff erosion, in concert with sea level rise in Puget Sound. The Panel reviewed the references cited on page 102 and found supporting evidence for increased rainfall intensity and future sea level rise. However, evidence for more intense or frequent wind storms that would generate a change in wind waves and bluff erosion was not found in these references. In addition, Appendix B, Engineering, includes sea level rise as a consideration in site design, but not the impacts of increased storm intensity, magnitude, or frequency.

While it is reasonable to expect bluffs and shorelines to be exposed to more erosion due to increased duration of inundation by rising sea levels, such effects cannot necessarily be attributed to storm intensity, frequency, and magnitude.

Significance – Low

A more accurate description of the effects of climate change on project alternatives would improve the DFR/EIS.

Recommendations for Resolution

1. Add a paragraph in the main report to clarify what specific storm parameters are expected to increase in intensity, frequency, and magnitude (e.g., pressure, rainfall, wind, etc.) and provide a more detailed description of the effects on physical processes.
2. Provide references that support specific statements above regarding anticipated changes to storms in Puget Sound. If supporting references are absent, remove statements.
3. Address risk associated with increased storm intensity, magnitude, and frequency in Appendix B and identify potential studies needed, if the general statements are correct.

5. REFERENCES

OMB (2004). Final Information Quality Bulletin for Peer Review. Executive Office of the President, Office of Management and Budget, Washington, D.C. Memorandum M-05-03. December 16.

The National Academies (2003). Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports. The National Academies (National Academy of Science, National Academy of Engineering, Institute of Medicine, National Research Council). May 12.

USACE (2000). Planning – Planning Guidance Notebook. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. Engineer Regulation (ER) 1105-2-100. April 22.

USACE (2008). Civil Works Cost Engineering. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. Engineer Regulation (ER) No. 1110-2-1302. September 15, 2008.

USACE (2012a). Water Resources Policies and Authorities: Civil Works Review. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. Engineer Circular (EC) 1165-2-214. December 15.

USACE (2012b). Engineering Within the Planning Modernization Paradigm. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. Engineering and Construction Bulletin (ECB) No. 2012-18. May 18, 2012.

USACE (2013). Enclosure 5: Decision Log. "Puget Sound Nearshore Ecosystem Restoration (PSNER) Study, HQUSACE Policy Issues Revised TSP, 24 October 2013, NWD Responses 16 December 2013," Item 5.A, Level of Detail. Department of the Army, U.S. Army Corps of Engineers.

USDA (2014). Comments to the Draft Feasibility Report, Environmental Impact Statement - Puget Sound Near Shore Restoration Study. Correspondence from Roylene Rides-At-The-Door, U.S. Department of Agriculture, Natural Resources Conservation Service. Submitted via the Puget Sound Nearshore Ecosystem Restoration Project Public Comment process to the U.S. Army Corps of Engineers, November 21, 2014.

Van Ness Feldman LLP (2014). Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) - Beaconsfield Project. Correspondence from Brent Carson, Van Ness Feldman LLP, Seattle Washington. Submitted via the Puget Sound Nearshore Ecosystem Restoration Project Public Comment process to the U.S. Army Corps of Engineers, November 21, 2014.

APPENDIX A

IEPR Process for the Puget Sound Nearshore Ecosystem Restoration
DFR/EIS Project

A.1 Planning and Conduct of the Independent External Peer Review (IEPR)

Table A-1 presents the schedule followed in executing the Puget Sound Nearshore Ecosystem Restoration (PSNER) Draft Integrated Feasibility Report/Environmental Impact Statement (DFR/EIS) Independent External Peer Review (IEPR) (hereinafter: Puget Sound DFR/EIS IEPR). Due dates for milestones and deliverables are based on the award/effective date of September 29, 2014. The review documents were provided by U.S. Army Corps of Engineers (USACE) on October 10, 2014. Note that the work items listed under Task 6 occur after the submission of this report. Battelle will enter the 10 Final Panel Comments developed by the Panel into USACE's Design Review and Checking System (DrChecks), a Web-based software system for documenting and sharing comments on reports and design documents, so that USACE can review and respond to them. USACE will provide responses (Evaluator Responses) to the Final Panel Comments, and the Panel will respond (BackCheck Responses) to the Evaluator Responses. All USACE and Panel responses will be documented by Battelle. Battelle will provide USACE and the Panel a pdf printout of all DrChecks entries, through comment closeout, as a final deliverable and record of the IEPR results.

Table A-1. Puget Sound DFR/EIS Complete IEPR Schedule

Task	Action	Due Date
1	Award/Effective Date	9/29/2014
	Review documents available	10/7/2014
	Battelle submits draft Work Plan ^a	10/10/2014
	USACE provides comments on draft Work Plan	10/16/2014
	Battelle submits final Work Plan ^a	10/16/2014
2	Battelle requests input from USACE on the conflict of interest (COI) questionnaire	10/1/2014
	USACE provides comments on COI questionnaire	10/3/2014
	Battelle submits list of selected panel members ^a	10/14/2014
	USACE confirms the panel members have no COI	10/16/2014
	Battelle completes subcontracts for panel members	10/23/2014
3	Battelle convenes kick-off meeting with USACE	10/6/2014
	Battelle sends review documents to panel members	10/23/2014
	Battelle convenes kick-off meeting with panel members	10/24/2014
	Battelle convenes kick-off meeting with USACE and panel members	10/27/2014
	Battelle convenes mid-review teleconference for panel members to ask clarifying questions of USACE	11/12/2014
	Agency Decision Milestone Meeting	Estimated 2/2015

Table A-1. Puget Sound DFR/EIS Complete IEPR Schedule (continued)

Task	Action	Due Date
3	Civil Works Review Board (CWRB) Meeting	Estimated 9/2015
4	Panel members complete their individual reviews	11/13/2014
	Battelle provides panel members with talking points for Panel Review Teleconference	11/18/2014
	Battelle convenes Panel Review Teleconference	11/19/2014
	Battelle provides Final Panel Comment templates and instructions to panel members	11/20/2014
	Panel members provide draft Final Panel Comments to Battelle	12/1/2014
	Battelle provides feedback to panel members on draft Final Panel Comments; panel members revise Final Panel Comments	12/2/2014 - 12/8/2014
	Public comments available to Battelle	12/8/2014
	Battelle send public comments to panel members	12/9/2014
	Panel members complete their review of public comments	12/10/2014
	Panel finalizes Final Panel Comments	12/12/2014
5	Battelle provides Final IEPR Report to panel members for review	12/12/2014
	Panel members provide comments on Final IEPR Report	12/12/2014
	Battelle submits Final IEPR Report to USACE ^a	12/17/2014
6^b	Battelle inputs Final Panel Comments to DrChecks and provides Final Panel Comment response template to USACE	12/22/2014
	Battelle convenes teleconference with USACE to review the Post-Final Panel Comment Response Process	1/5/2015
	Battelle convenes teleconference with Panel to review the Post-Final Panel Comment Response Process	1/5/2015
	USACE provides draft Project Delivery Team (PDT) Evaluator Responses to Battelle	1/20/2015
	Battelle provides the panel members the draft PDT Evaluator Responses	1/22/2015
	Panel members provide Battelle with draft BackCheck Responses	1/27/2015
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	1/28/2015
	Battelle convenes Comment-Response Teleconference with panel members and USACE	1/29/2015

Table A-1. Puget Sound DFR/EIS Complete IEPR Schedule (continued)

Task	Action	Due Date
6 ^b	USACE inputs final PDT Evaluator Responses to DrChecks	2/5/2015
	Battelle provides final PDT Evaluator Responses to panel members	2/10/2015
	Panel members provide Battelle with final BackCheck Responses	2/13/2015
	Battelle inputs the Panel's final BackCheck Responses in DrChecks	2/13/2015
	Battelle submits pdf printout of DrChecks project file ^a	2/17/2015
	CWRB Meeting (Estimated Date) ^c	Estimated 9/2015
	Contract End/Delivery Date	9/28/2015

a Deliverable.

b Task 6 occurs after the submission of this report

c The CWRB meeting was listed in the Performance Work Statement under Task 3 but was relocated in this schedule to reflect the chronological order of activities.

At the beginning of the Period of Performance for the Puget Sound DFR/EIS IEPR, Battelle held a kick-off meeting with USACE to review the preliminary/suggested schedule, discuss the IEPR process, and address any questions regarding the scope (e.g., clarify expertise areas needed for panel members). Any revisions to the schedule were submitted as part of the final Work Plan. In addition, 53 charge questions were provided by USACE and included in the draft and final Work Plans. Battelle added two questions that sought summary information from the IEPR Panel. The final charge also included general guidance for the Panel on the conduct of the peer review (provided in Appendix C of this final report).

Prior to beginning their review and within four days of their subcontracts being finalized, all members of the Panel attended a kick-off meeting via teleconference planned and facilitated by Battelle in order to review the IEPR process, the schedule, communication procedures, and other pertinent information for the Panel. Battelle planned and facilitated a second kick-off meeting via teleconference during which USACE presented project details to the Panel. Before the meetings, the IEPR Panel received an electronic version of the final charge as well as the Puget Sound DFR/EIS IEPR review documents and reference materials listed below. The documents and files in bold font were provided for review; the other documents were provided for reference or supplemental information only.

- **Feasibility Study and Environmental Impact Statement (Main Report) (325 pages)**
- Appendix A: Two-Page Fact Sheets (40 pages)
- **Appendix B: Engineering Appendix (600 pages)**
- **Appendix C: Real Estate Plan (250 pages)**
- **Appendix D: Cultural Resources Plan (10 pages)**
- **Appendix E: Monitoring Framework (75 pages)**
- **Appendix F: Supplemental Information on Biological Environment (25 pages)**
- **Appendix G: Ecosystem Output Model White Paper (70 pages)**
- **Appendix H: Public Review Comments (91 pages)**

- **Appendix I: Economic Appendix (50 pages)**
- **Appendix J: Environmental Compliance Documentation (65 pages)**
- Risk Register
- PSNER Enclosure 5 Decision Log
- USACE guidance Civil Works Review, (EC 1165-2-214) dated 15 December 2012
- Office of Management and Budget's *Final Information Quality Bulletin for Peer Review* released December 16, 2004.

About halfway through the review of the Puget Sound DFR/EIS IEPR documents, a teleconference was held with USACE, the Panel, and Battelle so that USACE could answer any questions the Panel had concerning either the review documents or the project. Prior to this teleconference, Battelle submitted 14 panel member questions to USACE. USACE was able to provide responses to all of the questions during the teleconference or shortly thereafter.

In addition, throughout the review period, USACE provided documents at the request of panel members. These documents were provided to Battelle and then sent to the Panel as additional information only and were not part of the official review. A list of these additional documents requested by the Panel is provided below.

- Seattle & Tacoma Federal Navigation Channels
- Washington State Ferry Map
- NOAA navigation charts of shipping lanes in the Strait and Puget Sound.

A.2 Review of Individual Comments

The Panel was instructed to address the charge questions/discussion points within a charge question response table provided by Battelle. At the end of the review period, the Panel produced individual comments in response to the charge questions/discussion points. Battelle reviewed the comments to identify overall recurring themes, areas of potential conflict, and other overall impressions. At the end of the review, Battelle summarized the individual comments in a preliminary list of 10 overall comments and discussion points. Each panel member's individual comments were shared with the full Panel in a merged individual comments table.

A.3 IEPR Panel Teleconference

Battelle facilitated a four-hour teleconference with the Panel so that the panel members could exchange technical information. The main goal of the teleconference was to identify which issues should be carried forward as Final Panel Comments in the Final IEPR Report and decide which panel member would serve as the lead author for the development of each Final Panel Comment. This information exchange ensured that the Final IEPR Report would accurately represent the Panel's assessment of the project, including any conflicting opinions. The Panel engaged in a thorough discussion of the overall positive and negative comments, added any missing issues of significant importance to the findings, and merged any related individual comments. At the conclusion of the teleconference, Battelle reviewed each Final Panel Comment with the Panel, including the associated level of significance, and confirmed the lead author for each comment.

At the end of these discussions, the Panel identified nine comments and discussion points that should be brought forward as Final Panel Comments.

A.4 Preparation of Final Panel Comments

Following the teleconference, Battelle prepared a summary memorandum for the Panel documenting each Final Panel Comment (organized by level of significance). The memorandum provided the following detailed guidance on the approach and format to be used to develop the Final Panel Comments for the Puget Sound DFR/EIS IEPR:

- **Lead Responsibility:** For each Final Panel Comment, one Panel member was identified as the lead author responsible for coordinating the development of the Final Panel Comment and submitting it to Battelle. Battelle modified lead assignments at the direction of the Panel. To assist each lead in the development of the Final Panel Comments, Battelle distributed the merged individual comments table, a summary detailing each draft final comment statement, an example Final Panel Comment following the four-part structure described below, and templates for the preparation of each Final Panel Comment.
- **Directive to the Lead:** Each lead was encouraged to communicate directly with the other panel member as needed and to contribute to a particular Final Panel Comment. If a significant comment was identified that was not covered by one of the original Final Panel Comments, the appropriate lead was instructed to draft a new Final Panel Comment.
- **Format for Final Panel Comments:** Each Final Panel Comment was presented as part of a four-part structure:
 1. **Comment Statement** (succinct summary statement of concern)
 2. **Basis for Comment** (details regarding the concern)
 3. **Significance** (high, medium/high, medium, medium/low, and low; see description below)
 4. **Recommendation(s) for Resolution** (see description below).
- **Criteria for Significance:** The following were used as criteria for assigning a significance level to each Final Panel Comment:
 1. **High:** Describes a fundamental issue with the project that affects the current recommendation or justification of the project, and which will affect its future success, if the project moves forward without the issue being addressed. Comments rated as high indicate that the Panel determined that the current methods, models, and/or analyses contain a “showstopper” issue.
 2. **Medium/High:** Describes a potential fundamental issue with the project, which has not been evaluated at a level appropriate to this stage in the SMART Planning process. Comments rated as medium/high indicate that the Panel analyzed or assessed the methods, models, and/or analyses available at this stage in the SMART Planning process and has determined that if the issue is not addressed, it could lead to a “showstopper” issue.

3. **Medium:** Describes an issue with the project, which does not align with the currently assessed level of risk assigned at this stage in the SMART Planning process. Comments rated as medium indicate that, based on the information provided, the Panel identified an issue that would raise the risk level if the issue is not appropriately addressed.
 4. **Medium/Low:** Affects the completeness of the report at this time in describing the project, but will not affect the recommendation or justification of the project. Comments rated as medium/low indicate that the Panel does not currently have sufficient information to analyze or assess the methods, models, or analyses.
 5. **Low:** Affects the understanding or accuracy of the project as described in the report, but will not affect the recommendation or justification of the project. Comments rated as low indicate that the Panel identified information that was mislabeled or incorrect or that certain data or report section(s) were not clearly described or presented.
- Guidelines for Developing Recommendations: The recommendation section was to include specific actions that USACE should consider to resolve the Final Panel Comment (e.g., suggestions on how and where to incorporate data into the analysis, how and where to address insufficiencies, areas where additional documentation is needed).

Battelle reviewed and edited the Final Panel Comments for clarity, consistency with the comment statement, and adherence to guidance on the Panel's overall charge, which included ensuring that there were no comments regarding either the appropriateness of the selected alternative or USACE policy. At the end of this process, nine Final Panel Comments were prepared and assembled. There was no direct communication between the Panel and USACE during the preparation of the Final Panel Comments. The Final Panel Comments are presented in the main report.

A.5 Conduct of the Public Comment Review

Battelle received a PDF file containing 91 pages of public comments on the PSNER DFR/EIS from USACE on December 8, 2014. Battelle then sent the public comments to the panel members on December 9, 2014 in addition to two charge questions:

1. **Does information provided, or do concerns raised by the public, identify any additional discipline-specific technical issues with regard to the overall report?**
2. **Has adequate stakeholder involvement occurred to identify issues of interest and solicit feedback from interested parties?**

The panel members were charged with responding to the two charge questions above.

Near the end of the review period, the Panel produced individual comments in response to the charge questions. Each panel member's individual comments were shared with the full Panel via email. Battelle reviewed the comments to identify any new technical concerns that had not been previously identified during the initial IEPR. The panel members confirmed that one new Final Panel Comment would be developed to summarize the additional issues raised by the IEPR Panel.

One panel member was identified by Battelle as the lead author responsible for coordinating the development of the Final Panel Comment and submitting it to the other panel members and Battelle. The

Final Panel Comment was developed as part of the four-part structure following guidance previously described in the Final IEPR Report.

Battelle reviewed and edited the Final Panel Comment for clarity, consistency with the comment statement, and adherence to guidance on the Panel's overall charge, which included ensuring that the comment did not make any observations regarding either the appropriateness of the selected alternative or USACE policy. There was no direct communication between the Panel and USACE during the preparation of the Final Panel Comment.

APPENDIX B

Identification and Selection of IEPR Panel Members
for the Puget Sound Nearshore Ecosystem Restoration DFR/EIS Project

This page is intentionally left blank.

B.1 Panel Identification

The candidates for the Puget Sound Nearshore Ecosystem Restoration (PSNER) Draft Integrated Feasibility Study/Environmental Impact Statement (DFR/EIS) Independent External Peer Review (IEPR) Panel were evaluated based on their technical expertise in the following key areas: Civil Works planning, environmental biology, coastal engineering, and civil engineering. These areas correspond to the technical content of the Puget Sound DFR/EIS IEPR review documents and overall scope of the PSNER DFR/EIS project.

To identify candidate panel members, Battelle reviewed the credentials of the experts in Battelle's Peer Reviewer Database, sought recommendations from colleagues, contacted former panel members, and conducted targeted Internet searches. Battelle evaluated these candidate panel members in terms of their technical expertise and potential conflicts of interest (COIs). Of these candidates, Battelle chose the most qualified individuals, confirmed their interest and availability, and ultimately selected four experts for the final Panel.

The four selected reviewers constituted the final Panel. The remaining candidates were not proposed for a variety of reasons, including lack of availability, disclosed COIs, or lack of the precise technical expertise required.

The candidates were screened for the following potential exclusion criteria or COIs.¹ These COI questions serve as a means of disclosure and to better characterize a candidate's employment history and background. Providing a positive response to a COI screening question did not automatically preclude a candidate from serving on the Panel. For example, participation in previous USACE technical peer review committees and other technical review panel experience was included as a COI screening question. A positive response to this question could be considered a benefit.

- Previous and/or current involvement by you or your firm² in the Puget Sound Nearshore Ecosystem Restoration (PSNER) Draft Integrated Feasibility Report/Environmental Impact Statement (DFR/EIS) or technical appendices.
- Previous and/or current involvement by you or your firm² in ecosystem restoration projects in Washington State's Puget Sound Basin.
- Previous and/or current involvement by you or your firm² in the PSNER DFR/EIS-related projects.

¹ Battelle evaluated whether scientists in universities and consulting firms that are receiving USACE-funding have sufficient independence from USACE to be appropriate peer reviewers. See OMB (2004, p. 18), "...when a scientist is awarded a government research grant through an investigator-initiated, peer-reviewed competition, there generally should be no question as to that scientist's ability to offer independent scientific advice to the agency on other projects. This contrasts, for example, to a situation in which a scientist has a consulting or contractual arrangement with the agency or office sponsoring a peer review. Likewise, when the agency and a researcher work together (e.g., through a cooperative agreement) to design or implement a study, there is less independence from the agency. Furthermore, if a scientist has repeatedly served as a reviewer for the same agency, some may question whether that scientist is sufficiently independent from the agency to be employed as a peer reviewer on agency-sponsored projects."

² Includes any joint ventures in which a panel member's firm is involved and if the firm serves as a prime or as a subcontractor to a prime.

- Previous and/or current involvement by you or your firm² in the conceptual or actual design, construction, or operation and maintenance (O&M) of any projects in the PSNER DFR/EIS-related projects.
- Current employment by the U.S. Army Corps of Engineers (USACE).
- Previous and/or current involvement with paid or unpaid expert testimony related to PSNER DFR/EIS.
- Previous and/or current employment or affiliation with members of the non-Federal sponsors or any of the following cooperating Federal, State, County, local and regional agencies, environmental organizations, and interested groups: The Puget Sound Nearshore Ecosystem Restoration (PSNER) Project; Puget Sound Partnership; Washington State Department of Ecology; Washington State Department of Fish and Wildlife; Washington State Department of Natural Resources; Estuary and Salmon Restoration Project (for pay or pro bono).
- Past, current, or future interests or involvements (financial or otherwise) by you, your spouse, or your children related to the PSNER DFR/EIS project.
- Current personal involvement with other USACE projects, including whether involvement was to author any manuals or guidance documents for USACE. If yes, provide titles of documents or description of project, dates, and location (USACE district, division, Headquarters, Engineer Research and Development Center [ERDC], etc.), and position/role. Please highlight and discuss in greater detail any projects that are specifically with the Seattle District.
- Previous or current involvement with the development or testing of models that will be used for, or in support of the PSNER DFR/EIS project.
- Current firm² involvement with other USACE projects, specifically those projects/contracts that are with the Seattle District. If yes, provide title/description, dates, and location (USACE district, division, Headquarters, ERDC, etc.), and position/role. Please also clearly delineate the percentage of work you personally are currently conducting for the Seattle District. Please explain.
- Any previous employment by USACE as a direct employee, notably if employment was with the Seattle District. If yes, provide title/description, dates employed, and place of employment (district, division, Headquarters, ERDC, etc.), and position/role.
- Any previous employment by USACE as a contractor (either as an individual or through your firm²) within the last 10 years, notably if those projects/contracts are with the Seattle District. If yes, provide title/description, dates employed, and place of employment (district, division, Headquarters, ERDC, etc.), and position/role.
- Previous experience conducting technical peer reviews. If yes, please highlight and discuss any technical reviews concerning ecosystem review, flood management, and include the client/agency and duration of review (approximate dates).
- Pending, current, or future financial interests in PSNER DFR/EIS related contracts/awards from USACE.
- A significant portion (i.e., greater than 50%) of personal or firm² revenues within the last 3 years came from USACE contracts.
- A significant portion (i.e., greater than 50%) of personal or firm² revenues within the last 3 years from contracts with the non-federal sponsor (Washington Department of Fish and Wildlife).
- Any publicly documented statement (including, for example, advocating for or discouraging against) related to the PSNER DFR/EIS project.

- Participation in relevant prior and/or current Federal studies relevant to this project and/or the PSNER DFR/EIS Puget Sound Nearshore General Investigation
- Previous and/or current participation in prior non-Federal studies relevant to this project and/or the PSNER DFR/EIS Puget Sound Nearshore General Investigation
- Is there any past, present, or future activity, relationship, or interest (financial or otherwise) that could make it appear that you would be unable to provide unbiased services on this project? If so, please describe:

Other considerations:

- Participation in previous USACE technical review panels
- Other technical review panel experience.

B.2 Panel Selection

In selecting the final members of the Panel, Battelle chose experts who best fit the expertise areas and had no COIs. Three of the four final reviewers are affiliated with a university or consulting company; the other is an independent consultant. Battelle established subcontracts with the panel members when they indicated their willingness to participate and confirmed the absence of COIs through a signed COI form. USACE was given the list of candidate panel members, but Battelle selected the final Panel.

An overview of the credentials of the final four members of the Panel and their qualifications in relation to the technical evaluation criteria is presented in Table B-1. More detailed biographical information regarding each panel member and his area of technical expertise is presented in Section B.3.

Table B-1. Puget Sound DFR/EIS IEPR Panel: Technical Criteria and Areas of Expertise

Technical Criterion	Bastian	Guillen	Darnell	Wong
Civil Works Planning				
Minimum 10 years of experience in public works planning	X			
Experience with experience in planning, design, and/or construction of large-scale ecosystem restoration projects with public and interagency interests.	X			
Very familiar with USACE plan formulation process, procedures and standards.	X			
Familiar with evaluation of alternative plans for ecosystem restoration projects.	X			
Experience related to evaluating traditional National Ecosystem Restoration (NER) plan benefits associated with ecosystem projects	X			
Experience with USACE methodologies for performing cost effectiveness/incremental cost analysis (CE/ICA).	X			
Experience in determining the cost effectiveness of fish passage.	X			
Degree in related field.	X			
Environmental Biology				
Minimum 10 years of experience directly related to environmental evaluation or review		X		
Experience with experience in planning, design, and/or construction of large-scale ecosystem restoration projects with public and interagency interests.		X		
Extensive knowledge of the following:				
a. estuarine ecology		X		
b. salmonid biology (spawning, rearing, freshwater migration)		X		
c. wetlands		X		
d. riparian habitats		X		
e. riverine systems		X		
f. process-based restoration		X		
Demonstrated experience working with National Environmental Policy Act (NEPA) impact assessments, including cumulative effects analyses, for complex ecosystem projects with competing trade-offs		X		
MS degree or higher in a related field		X		

Table B-1. Puget Sound DFR/EIS IEPR Panel: Technical Criteria and Areas of Expertise (continued)

Technical Criterion	Bastian	Guillen	Darnell	Wong
Coastal Engineering				
Minimum 10 years of experience in coastal engineering			X	
Experience with experience in planning, design, and/or construction of large-scale ecosystem restoration projects with public and interagency interests.			X	
Expert in coastal engineering with a strong background in river hydrology and hydraulics.			X	
Extensive background in coastal theory and practice.			X	
Registered professional engineer			X	
Extensive knowledge of the coastal and hydraulic evaluation of nearshore restoration actions.			X	
MS degree or higher in engineering.			X	
Registered professional engineer.			X	
Civil Engineering				
Minimum 10 years of experience in civil engineering				X
Experience with experience in planning, design, and/or construction of large-scale ecosystem restoration projects with public and interagency interests.				X
Demonstrated experience in river restoration.				X
Experience with the design and construction of:				
a. levees				X
b. large woody debris structures				X
c. channel construction				X
d. road removal/relocation				X
MS degree or higher in engineering.				X
Registered professional engineer.				X

B.3 Panel Member Qualifications

David Bastian, P.E.

Role: Civil works planning

Affiliation: Independent Consultant

Mr. Bastian is an independent consultant and professional engineer for David Bastian Consulting in Annapolis, Maryland, specializing in USACE compliance and policy review, plan formulation and incremental cost analysis, and hydraulic and river engineering. He earned his B.S. in civil engineering from the Georgia Institute of Technology and his M.S. in River Engineering from Delft University, Holland, and is a registered professional engineer in Mississippi. He was previously employed at USACE, where he held positions as Deputy Chief of Staff for Support, Office Chief of Engineers; Assistant Director of Civil Works, Office Chief of Engineers; technical and policy compliance review expert, Washington Level Review Center; and navigation research, USACE Institute for Water Resources. He has managed interdisciplinary reviews of over 70 feasibility reports and has participated as a Civil Works planning and economics expert on several USACE IEPR panels.

Mr. Bastian is proficient in the USACE plan formulation process, procedures, standards, guidance, and economic evaluation techniques and in the application of the USACE six-step process defined in the Principles and Guidelines. He has over 35 years of experience with USACE, with 10 years as contractor/consultant on USACE projects and 30 years of demonstrated experience in public works planning, working with project teams to identify and evaluate measures and alternatives using appropriate planning methodologies to reduce life safety risk. He is also an expert on USACE policy, including Engineer Regulation (ER) 1105-2-100. His project history has resulted in the creation of over 100 USACE reports evaluating and comparing alternative plans, including ecosystem restoration projects.

Mr. Bastian is experienced in the planning, design, and/or construction of large-scale ecosystem restoration projects with public and interagency interests. From 2006-2010, he was involved in the planning, design and construction of segments of the Louisiana Coastal Protection & Restoration, Louisiana Coastal Area and Greater New Orleans Hurricane Storm Damage and Risk Reduction System. These studies had extensive public and interagency interests and the project's nearby sensitive habitats required NER identification. He is very familiar with the evaluation of alternative plans for ecosystem restoration projects as a result of his experience as a USACE Headquarters reviewer and as a private consultant. In addition, his past experience includes his work in the Environmental Laboratory of the Waterways Experiment Station, developing decision protocol. He has demonstrable experience related to the evaluation of traditional NER plan benefits associated with ecosystem projects, including his involvement in the Boardman River, Michigan, Ecosystem Restoration Study in 2011- 2012. Mr. Bastian was also an USACE IEPR panel expert on the Picayune Strand Restoration Project Draft Limited Reevaluation Report and Environmental Assessment Post Authorization Change Report.

Mr. Bastian is experienced with USACE methodologies for performing cost effectiveness/incremental cost analysis (CE/ICA) as a result of his more than 20 years of experience. Relevant studies include such recent projects as the Blanchard River Watershed. His recent participation in the preparation of the Boardman River, Michigan, Ecosystem Restoration Study demonstrates his experience with projects in which he was tasked with determining the cost effectiveness of fish passages.

George Guillen, Ph.D., C.F.S.

Role: Environmental biology

Affiliation: Environmental Institute of Houston, University of Houston-Clear Lake, Houston, Texas

Dr. Guillen is the Executive Director of the Environmental Institute of Houston and Associate Professor of Biology and Environmental Science at the University of Houston-Clear Lake (UHCL), Houston, Texas. He also teaches programs in fisheries population dynamics, limnology, and marine biology courses at UHCL and Texas A&M University, Galveston, Texas. He earned his Ph.D. in Environmental Science from the University of Texas School of Public Health in 1996; is a Certified Fisheries Scientist for the American Fisheries Society; and has more than 30 years of applicable experience in the field of wildlife and fish sciences. He has served with the U.S. Department of the Interior Bureau of Ocean Energy Management; the Minerals Management Service (MMS), in New Orleans, Louisiana; and the U.S. Department of the Interior Fish and Wildlife Service (USFWS) in Arcata, California. At the USFWS, he was responsible for the fisheries and contaminant program activities in the Klamath and Northern California Central Pacific Coast ecoregion for issues involving contaminants, water quality, instream flows, fisheries restoration and management and the evaluation of impacts on state and Federal listed species and critical habitats.

Dr. Guillen is experienced in planning, design, and/or construction of large-scale ecosystem restoration projects with public and interagency interests. In his position as lead biologist for USFWS in northern California, he reviewed salmonid restoration projects including fish passage, habitat improvement, and dam operations. He also served on the Galveston Bay Estuary Monitoring and Research Committee for over 10 years reviewing multiple restoration projects associated with oyster, wetland and seagrass restoration projects. Dr. Guillen has demonstrable experience working with National Environmental Policy Act (NEPA) impact assessments, including cumulative effects analyses, for complex ecosystem projects with competing trade-offs. He received formal NEPA training from a private contractor (The Shipley Group) while serving as the chief scientist for MMS and was responsible for the preparation of environmental assessments and environmental impact statements associated with the Gulf of Mexico Lease sales and individual drilling permits. The studies focused on the interaction of oil spill risks associated with the coastal zone, including discharges from producing wells, pipelines, weather, and sensitive coastal resources and fisheries. Examples of other studies conducted while at the Arcata Fish and Wildlife Office (AFWO), Pacific Southwest Region, included the U.S. Fish and Wildlife Service, U.S. Bureau of Reclamation, Hoopa Valley Tribe, and Trinity County, Trinity River Mainstem Fishery Restoration Environmental Impact Statement / Environmental Impact Report. In addition, under Federal Financial Assistance Grants and Agreements, the AFWO and Dr. Guillen were required to evaluate the compliance of these proposed projects with NEPA, including effects on public health, environmental effects, endangered and threatened species, and resources requiring compliance with Fish and Wildlife Coordination Act.

Dr. Guillen has extensive knowledge of estuarine ecology. He has conducted research on estuarine larval fish communities; has contributed to the development of estuarine Index of Biotic Integrity using tidal stream fishes; has directed more than 15 estuarine research projects, including externally funded projects on both the Gulf and Pacific coasts; and has served on the Klamath River fisheries management team. He is also a past member of the North California, Southern Oregon Pacific Fisheries Management Council stock assessment team. As the Fisheries Program Chief in northern California, and southern Oregon USFWS Fisheries Program on Humboldt Bay and nearshore Pacific Ocean, he managed coastal salmonid (juvenile and adult) monitoring and research programs for Humboldt Bay and four major river systems and associated coastal lagoons, including special studies involving Chinook and Coho salmon,

green sturgeon, steelhead, juvenile rockfish, eelgrass, oysters, marine birds and coordination with other Federal and state agencies. He currently directs all aspects of an ongoing stream monitoring program funded by Clean Rivers Program which monitors coastal tidally influenced rivers and streams and directed the statewide Texas portion of the U.S. Environmental Protection Agency (EPA)-funded 2011 National Coastal Assessment. As a result of his experience as Fisheries Program Chief at the northern California, southern Oregon Fish and Wildlife Service/USFWS Fisheries Program on the Klamath, Smith, Eel, and other watersheds and nearshore waters, he is familiar with salmonid biology, including spawning, rearing, and freshwater migration. He has managed salmonid (juvenile and adult) monitoring and research programs for four major river systems and associated watersheds, reviewed restoration projects and special studies, and coordinated activities with other Federal and state agencies.

Dr. Guillen has extensive knowledge of wetlands, riparian habitat and riverine systems. He has conducted past and ongoing research of the biota, habitat, and water quality associated with wetlands, including mitigation and restoration project monitoring and assessment. He oversaw the construction of an EPA-funded wetland creation project in Galveston Bay and conducted wetland delineations according to USACE regulations. He has reviewed and conducted state 401 certification of USACE404 and section 10 permitted projects as a member of the Texas Commission on Environmental Quality (previously the Texas Natural Resource Conservation Commission) review team during the 1990s and directed the statewide Texas portion of the EPA-funded 2012 National Wetlands Condition Assessment. His experience with riparian and riverine habitats is demonstrated by his participation in the Trinity River, California, Restoration Program for USFWS (2000-2004). He was also a member of the Basin and Bay Expert Science Team for the Brazos River and San Jacinto-Trinity River Basin Instream Flow and Freshwater Inflow Recommendations, Texas (2006–2014). He has extensive ongoing technical training in Rosgen methods, PHABSIM, and stream habitat assessment methods. He currently directs all aspects of an ongoing stream monitoring program funded by the Clean Rivers Program, which is overseen by the Houston Galveston Area Council in southeast, Texas; has taught numerous courses for USFWS and other state agencies on the investigation of fish kills in streams and rivers; and directed the statewide Texas portion of the EPA-funded 2013-2014 National Rivers and Streams Assessment.

Dr. Guillen has extensive experience in process-based restoration and has employed process-based restoration principles in the planning, review, monitoring and execution of various restoration projects. Studies include the Trinity River, California, Restoration Program, where damage associated with the damming of the Trinity River was evaluated. Restoration included attempting to replenish gravel recruitment (using historical sediment recruitment data) and flow regimes (using the historical hydrography). Another example was the Brazos River and San Jacinto-Trinity River Basin in Texas, where he was charged with developing Instream Flow and Freshwater Inflow Recommendations. For that project, the goal was to support a healthy and balanced ecosystem and restore critical functions and processes, including in-river and estuarine sediment transport, nutrient transport and processing, seasonal salinity fluctuations to support spawning and migration of over 50 species of fish, support of freshwater emergent and submerged vegetation in the upper estuary, and migration of anadromous and catadromous species of fish, crustacean, and estuarine species, including the reduction of pathogens infesting oysters to ensure their maximum harvest. As the Texas Parks and Wildlife Department contaminants biologist, Dr. Guillen was responsible for the oversight of numerous oil spill restoration projects involving wetlands, oyster reefs, and streams and rivers impacted by pipeline and transportation-related spills. This included planning and reviewing the project to ensure that process-based restoration projects focused on correcting anthropogenic disruptions due to these processes, such that the

watershed ecosystem progressed along a recovery trajectory with minimal ongoing corrective intervention.

Joel Darnell, P.E.

Role: Coastal engineering

Affiliation: Coast & Harbor Engineering, Inc.

Mr. Darnell is a coastal engineer with Coast & Harbor Engineering. He earned his M.S. in ocean engineering from Oregon State University and is a registered professional engineer in Washington State. He has more than 11 years of engineering experience as well as several years of coastal engineering academic research. His experience includes planning, numerical modeling of coastal and estuarine systems (waves, tidal currents, riverine hydraulics, and sediment transport), permitting, final design, preparation of plans and specifications, construction management, and post-construction monitoring. He has performed analysis and design of projects throughout Puget Sound, the Columbia River Estuary, the Pacific Coast, and the Gulf Coast for the purposes of intertidal marsh restoration, pocket estuary restoration, bird rookery islands, fish passage, salmon enhancement, beach restoration, shellfish reef creation, habitat mitigation, shoreline protection and flooding reduction.

Mr. Darnell is experienced in the planning, design, and construction of large-scale ecosystem restoration projects with public and interagency interests. He has planned, designed, and constructed ecosystem restoration projects in Texas, Louisiana, Oregon, and Washington for both public, non-governmental organizations and private interests, some in collaboration with the National Oceanic and Atmospheric Administration, the National Marine Fisheries Service, USFWS, USACE, EPA and respective counterpart state agencies. The scale of projects has varied from large (many thousands of acres) to small (less than 2 acres). Relevant large-scale projects include the Crescent Harbor Marsh Restoration Engineering Study, Whidbey Island Naval Air Station, Washington; the 15,000-acre Matagorda Island Adaptive Management Plan, Matagorda County, Texas; and Marsh Restoration at Pintail Flats, Sabine Pass, Texas. Mr. Darnell is expert in coastal engineering and has a strong background in river hydrology and hydraulics. He has been a guest lecturer in coastal engineering at Texas A&M University and the University of Washington, has presented papers at numerous technical conferences for coastal engineering and ecosystem restoration³, and has authored a feature publication in the American Society of Civil Engineers' *Civil Engineering* magazine on marsh restoration⁴. He has extensive experience with coastal engineering design in the Puget Sound region and the Gulf Coast, and routinely performs and reviews river hydrology and 2D hydraulic modeling for coastal engineering applications in bays and estuarine systems in the Puget Sound region. Recent project experience includes the Elliott Bay Seawall Replacement Project, Seattle, Washington; the Marblemount Hatchery Flood Analysis, Marblemount, Washington; the SR520 Bridge Replacement Pontoon Construction Project, Grays Harbor, Washington; and the Youngs River Mitigation Site Hydraulic Technical Analysis, Clatsop County, Oregon.

Mr. Darnell has extensive background in coastal evaluation of nearshore restoration actions, including theory, analysis and design, applied numerical modeling, wave growth/transformation, and sediment

³Joel T. Darnell. 2005. "Wetlands Restoration: Restoring Functionality, not just Acreage." Proceedings of the 14th Biennial Coastal Zone Conference.

⁴Joel T. Darnell, Daniel J. Heilman. 2007. "Fringe Benefits," *Civil Engineering*, Volume 77, Number 5, May 2007.

transport. He has participated in numerous coastal engineering projects since 2004, including many ecosystem restoration projects that have been successfully permitted and constructed. Demonstrable experience includes his participation as coastal engineer on such studies as the Mission Creek Pocket Estuary Restoration, Olympia, Washington, and the Former Scott Paper Mill Cleanup, Anacortes, Washington. He has also been involved in post-construction assessment of restoration actions to better plan and design future projects based on lessons learned.

Miguel Wong, Ph.D., P.E.

Role: Civil engineering

Affiliation: Barr Engineering Company

Dr. Wong is a senior water resources engineer with Barr Engineering, Inc. He earned his Ph.D. in civil engineering from the University of Minnesota in 2006 and is a registered professional engineer in Minnesota. He has more than 20 years of combined experience in basic and applied research, river mechanics analysis, environmental evaluations, water balance and water quality modeling, and hydrologic modeling and hydraulic design.

Dr. Wong is experienced in the planning, feasibility, and detailed design of large ecosystem restoration projects. He has demonstrable experience in river restoration and has worked on large projects with both public and private stakeholders and interagency interests. This experience has included planning stream restorations, conducting environmental impact studies, developing flood risk reduction and design concepts, and conducting independent quality reviews for the engineering facets of projects. He has niche expertise in river evaluation and analysis that includes civil engineering and geomorphologic perspectives for gravel-, sand-, and silt/clay-bed riverine systems. He was involved in the design and construction of several stream and river restoration and stabilization projects, some of which were in tributaries of the Minnesota River and St. Croix River (including Bluff Creek, Riley Creek, Nine Mile Creek, and Valley Creek). He also was the technical lead for the Fargo-Moorhead Flood Risk Management project, which included the analysis, modeling, and design of a proposed 30-mile long meandering channel to be constructed within the main diversion of the Red River of the North.

Dr. Wong's experience with the design and construction of levees is reflected in such studies as the Mouse River and Fargo-Moorhead projects, which included miles of levee and dam design (the former included 21.6 miles of levees and 2.8 miles of floodwalls, while the latter dealt with 15 miles of dams and levees). His experience in the design and construction of diversion channels includes such projects as the Ferrominera, Venezuela, and Antamina, Peru, projects, in which channels were designed and constructed around mine waste facilities. His experience with the design and construction of large woody debris structures include the Nine Mile Creek project, which recreated a meandering river through wetland areas. He is also familiar with road removal and location and has participated in such projects as the Fargo-Moorhead Flood Risk Management project and the Mouse River enhanced flood protection project. He also was one of the primary authors for USACE's Final Feasibility Report and Environmental Impact Statement for the Fargo-Moorhead study.

Dr. Wong participated on the USACE IEPR panel for the technical review of the USACE Upper Des Plaines River Feasibility Study and Environmental Impact Statement, a project that had a large ecosystem restoration component. He also is a member of the American Geophysical Union, the International Association for Hydro-Environment Engineering and Research, and the Society of American Military Engineers. He has conducted technical peer reviews of manuscripts submitted to refereed

journals, including Water Resources Research and the Journal of Hydraulic Engineering, and presents regularly at technical conferences.

This page is intentionally left blank.

APPENDIX C

Final Charge to the IEPR Submitted to USACE on October 16, 2014, for the Puget Sound Nearshore Ecosystem Restoration DFR/EIS Project

This page is intentionally left blank.

CHARGE QUESTIONS AND GUIDANCE TO THE PANEL MEMBERS FOR THE IEPR OF THE PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION (PSNER) DRAFT INTEGRATED FEASIBILITY REPORT/ ENVIRONMENTAL IMPACT STATEMENT (DFR/EIS)

BACKGROUND

The Puget Sound Nearshore Ecosystem Restoration (PSNER) Draft Integrated Feasibility Report/Environmental Impact Statement (DFR/EIS) is authorized under Section 209 of the River and Harbor Act of 1962 (Pub.L. 87-874) and was initiated as a USACE Civil Title 1 General Investigation study under Public Law 106-60 (29 September 1999).

The study area includes the Puget Sound, the Strait of Juan de Fuca, and southern portions of the Strait of Georgia that occur within the borders of the United States. The waters of Puget Sound receive all of the drainage from the surrounding watershed that covers more than 17,000 square miles. This watershed is collectively referred to as the Puget Sound Basin. The basin is bordered on the east by the Cascade Mountains and on the west by the Olympic Mountains. While the basin occurs largely within northwestern Washington State, two of its headwater drainages originate just across the border in Canada. The basin is roughly 80% land and 20% water. The study area shoreline has a length of nearly 2,500 miles. The total water area covers nearly 3,000 square miles at mean high water.

The Puget Sound near shore zone provides ecologically important connections between major ecosystem types: terrestrial, freshwater, and marine. The near shore zone includes beaches and the adjacent top of coastal banks or bluffs, the shallow waters in estuarine deltas, and tidal waters from the head of tide to a depth of approximately 10 meters. This contiguous band around the shoreline of the study area hosts diverse ecosystems that are shaped by coastal geomorphology and local environmental conditions, such as wave energy, salinity, and geology. For the purpose of this study, the study area has been divided into the following seven sub-basins based on geographic features, such as oceanographic sills and bathymetric contours, and on water flow patterns:

- Strait of Juan de Fuca
- San Juan Islands – Georgia Strait
- Hood Canal
- North Central Puget Sound
- Whidbey
- South Central Puget Sound
- South Puget Sound

Five of these sub-basins are included within the watershed area of Puget Sound proper. The other two sub-basins include areas of the Strait of Juan de Fuca and the Georgia Strait seaward to the international boundary. Four planning objectives were developed to guide the formulation of alternative plans aimed at addressing the degradation of nearshore processes and impairment of ecosystem functions in Puget

Sound. These are critical factors in the declining nearshore ecosystem health of Puget Sound. The planning objectives are as follows:

1. Restore the size and quality of large river delta estuaries
2. Restore the number and quality of coastal embayments
3. Restore the size and quality of beaches
4. Increase understanding of natural process restoration in order to improve effectiveness of program actions

The study team developed four restoration strategies aligned with the PSNER planning objectives: (1) a river delta strategy, (2) a barrier embayment strategy, (3) a coastal inlet strategy, and (4) a beach strategy. These four strategies informed the development of potential restoration alternatives in Puget Sound's river deltas, barrier embayments, coastal inlets, and beaches. The Tentatively Selected Plan (TSP) includes 11 sites that, taken together, address all four of the formulated strategies for process-based restoration. The TSP would restore 5,354 acres of tidally influenced wetlands and would remove 75,172 feet of stressors from the nearshore zone, restoring the natural processes that support the ecosystem structures and functions provided by wetlands, kelp and eelgrass beds, and riparian vegetation.

OBJECTIVES

The objective of this work is to conduct an independent external peer review (IEPR) of the Puget Sound Nearshore Ecosystem Restoration (PSNER) Draft Integrated Feasibility Study/Environmental Impact Statement (hereinafter: Puget Sound DFR/EIS IEPR) in accordance with the Department of the Army, U.S. Army Corps of Engineers (USACE), Water Resources Policies and Authorities' *Civil Works Review* (Engineer Circular [EC] 1165-2-214, dated December 15, 2012), and the Office of Management and Budget's *Final Information Quality Bulletin for Peer Review* (December 16, 2004).

Peer review is one of the important procedures used to ensure that the quality of published information meets the standards of the scientific and technical community. Peer review typically evaluates the clarity of hypotheses, validity of the research design, quality of data collection procedures, robustness of the methods employed, appropriateness of the methods for the hypotheses being tested, extent to which the conclusions follow from the analysis, and strengths and limitations of the overall product.

The purpose of the IEPR is to assess the "adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used" (EC 1165-2-214; p. D-4) for the Puget Sound DFR/EIS IEPR review documents. The IEPR will be limited to technical review and will not involve policy review. The IEPR will be conducted by subject matter experts (i.e., IEPR panel members) with extensive experience in civil works planning, environmental biology, coastal engineering, and civil engineering issues relevant to the project. They will also have experience applying their subject matter expertise to ecosystem restoration.

The Panel will be "charged" with responding to specific technical questions as well as providing a broad technical evaluation of the overall project. Per EC 1165-2-214, Appendix D, review panels should identify, explain, and comment upon assumptions that underlie all the analyses, as well as evaluate the soundness of models, surveys, investigations, and methods. Review panels should be able to evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable. Reviews

should focus on assumptions, data, methods, and models. The panel members may offer their opinions as to whether there are sufficient analyses upon which to base a recommendation.

DOCUMENTS PROVIDED

The following is a list of documents, supporting information, and reference materials that will be provided for the review.

Documents for Review

The following documents are to be reviewed by designated discipline:

Title	Approx. No. of Pages
Feasibility Study and Environmental Impact Statement (Main Report)	325
Appendix A: Two-Page Fact Sheets	40
Appendix B: Engineering Appendix	600
Appendix C: Real Estate Plan	250
Appendix D: Cultural Resources Plan	10
Appendix E: Monitoring Framework	75
Appendix F: Supplemental Information on Biological Environment	25
Appendix G: Ecosystem Output Model White Paper	70
Appendix H: Public Review Comments	91
Appendix I: Economic Appendix	50
Appendix J*: Environmental Compliance Documentation	65
Total Page Count	1601

Documents for Reference

- USACE guidance *Civil Works Review*, (EC 1165-2-214) dated 15 December 2012
- Office of Management and Budget's *Final Information Quality Bulletin for Peer Review* released December 16, 2004.
- Foundations of SMART Planning
- SMART Planning Bulletin (PB 2013-03)
- SMART – Planning Overview
- Planning Modernization Fact Sheet.

SCHEDULE

This final schedule is based on the October 7, 2014, receipt of the final review documents.

Task	Action	Due Date
Conduct Peer Review	Battelle sends review documents to panel members	10/23/2014
	Battelle convenes kick-off meeting with panel members	10/24/2014
	Battelle convenes kick-off meeting with USACE and panel members	10/27/2014
	Battelle convenes mid-review teleconference for panel members to ask clarifying questions of USACE	11/12/2014
	Panel members complete their individual reviews	11/13/2014
Prepare Final Panel Comments and Final IEPR Report	Battelle provides panel members with talking points for Panel Review Teleconference	11/18/2014
	Battelle convenes Panel Review Teleconference	11/19/2014
	Battelle provides Final Panel Comment templates and instructions to panel members	11/20/2014
	Panel members provide draft Final Panel Comments to Battelle	12/1/2014
	Battelle provides feedback to panel members on draft Final Panel Comments; panel members revise Final Panel Comments	12/02/2014 through 12/09/2014
	Public comments available to Battelle	12/8/2014
	Battelle send public comments to panel members	12/9/2014
	Panel members complete their review of public comments	12/10/2014
	Panel finalizes Final Panel Comments	12/12/2014
	Battelle provides Final IEPR Report to panel members for review	12/12/2014
	Panel members provide comments on Final IEPR Report	12/12/2014
	Battelle submits Final IEPR Report to USACE	12/18/2014
Comment/Response Process	Battelle inputs Final Panel Comments to DrChecks and provides Final Panel Comment response template to USACE	12/22/2014
	Battelle convenes teleconference with Panel to review the Post-Final Panel Comment Response Process (if necessary)	1/5/2015
	USACE provides draft PDT Evaluator Responses to Battelle	1/20/2015
	Battelle provides the panel members the draft PDT Evaluator Responses	1/22/2015
	Panel members provide Battelle with draft BackCheck Responses	1/27/2015
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	1/28/2015
	Battelle convenes Comment-Response Teleconference with panel members and USACE	1/29/2015
	USACE inputs final PDT Evaluator Responses to DrChecks	2/5/2015
	Battelle provides PDT Evaluator Responses to panel members	2/10/2015

Task	Action	Due Date
	Panel members provide Battelle with final BackCheck Responses	2/13/2015
	Battelle inputs the panel members' final BackCheck Responses to DrChecks	2/13/2015
	Battelle submits pdf printout of DrChecks project file	2/17/2015
Civil Works Review Board (CWRB)	Panel prepares and/or reviews slides for CWRB	Estimated 9/2015
	Civil Works Review Board (CWRB) Meeting	Estimated 9/2015

* Deliverables

CHARGE FOR PEER REVIEW

Members of this IEPR Panel are asked to determine whether the technical approach and scientific rationale presented in the Puget Sound DFR/EIS IEPR documents are credible and whether the conclusions are valid. The Panel is asked to determine whether the technical work is adequate, competently performed, and properly documented; satisfies established quality requirements; and yields scientifically credible conclusions. The Panel is being asked to provide feedback on the economic, engineering, environmental resources, and plan formulation. The panel members are not being asked whether they would have conducted the work in a similar manner.

Specific questions for the Panel (by report section or appendix) are included in the general charge guidance, which is provided below.

General Charge Guidance

Please answer the scientific and technical questions listed below and conduct a broad overview of the Puget Sound DFR/EIS IEPR documents. Please focus your review on the review materials assigned to your discipline/area of expertise and technical knowledge. Even though there are some sections with no questions associated with them, that does not mean that you cannot comment on them. Please feel free to make any relevant and appropriate comment on any of the sections and appendices you were asked to review. In addition, please note the following guidance. Note that the Panel will be asked to provide an overall statement related to 2 and 3 below per USACE guidance (EC 1165-2-214; Appendix D).

1. Your response to the charge questions should not be limited to a “yes” or “no.” Please provide complete answers to fully explain your response.
2. Assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, and any biological opinions of the project study.
3. Assess the adequacy and acceptability of the economic analyses, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, and models used in evaluating economic or environmental impacts of the proposed project.

4. If appropriate, offer opinions as to whether there are sufficient analyses upon which to base a recommendation.
5. Identify, explain, and comment upon assumptions that underlie all the analyses, as well as evaluate the soundness of models, surveys, investigations, and methods.
6. Evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable.
7. Please focus the review on assumptions, data, methods, and models.

Please **do not** make recommendations on whether a particular alternative should be implemented, or whether you would have conducted the work in a similar manner. Also please **do not** comment on or make recommendations on policy issues and decision making. Comments should be provided based on your professional judgment, **not** the legality of the document.

1. If desired, panel members can contact one another. However, panel members **should not** contact anyone who is or was involved in the project, prepared the subject documents, or was part of the USACE Agency Technical Review (ATR).
2. Please contact the Battelle Project Manager (Dick Uhler, uhlerr@battelle.org) or Program Manager (Karen Johnson-Young (johnson-youngk@battelle.org)) for requests or additional information.
3. In case of media contact, notify the Battelle Program Manager, Karen Johnson-Young (johnson-youngk@battelle.org) immediately.
4. Your name will appear as one of the panel members in the peer review. Your comments will be included in the Final IEPR Report, but will remain anonymous.

Please submit your comments in electronic form to Dick Uhler, uhlerr@battelle.org, no later than November 13, 2014, 10 pm ET.

IEPR of the Puget Sound Nearshore Ecosystem Restoration (PSNER) Draft Integrated Feasibility Report/Environmental Impact Statement (DFR/EIS)

CHARGE QUESTIONS AND RELEVANT SECTIONS AS SUPPLIED BY USACE

General

1. Were all models in the analyses used in an appropriate manner?
2. Are the models sufficiently discriminatory to support the conclusions drawn from them (i.e., identify meaningful differences between alternatives)?
3. Were risk and uncertainty sufficiently considered?
4. Are potential life safety issues accurately and adequately described under existing, future without-project, and future with-project conditions?
5. In your opinion, are there sufficient analyses upon which to base the recommendation?
6. Does the environmental assessment satisfy the requirements of the National Environmental Policy Act (NEPA)? Were adequate considerations given to significant resources by the project?

Problem, Needs, Constraints, and Opportunities

7. Are the problems, needs, constraints, and opportunities adequately and correctly defined?
8. Do the identified problems, needs, constraints, and opportunities reflect a systems, watershed, and/or ecosystem approach, addressing a geographic area large enough to ensure that plans address the cause-and-effect relationships between affected resources and activities that are pertinent to achieving the study objectives; i.e., evaluate the resources and related demands as a system?
9. Does the study appropriately address the resources identified during the scoping process as important in making decisions relating to the identification of a tentatively selected plan (TSP)?

Affected Environment

10. Have the character and scope of the study area been adequately described and is the study area appropriate in terms of undertaking a systems/watershed/ecosystem-based investigation?
11. Do you agree with the general analyses of the existing social, financial, and natural resources within the study area?
12. For your particular area of expertise, provide an in-depth review of whether the analyses of the existing social, financial, and natural resources within the project area are sufficient to support the estimate of the impacts of the array of alternatives.
13. Given your area of expertise, does this section appropriately address the existing conditions of all resources pertinent to the study?

14. Were the surveys conducted to evaluate the existing social, financial, and natural resources adequate? If not, what types of surveys should have been conducted?
15. Were socioeconomic conditions adequately addressed? Were specific socioeconomic issues not addressed?
16. Was the hydrology discussion sufficient to characterize current baseline conditions and to allow for evaluation of how forecasted conditions (with and without proposed actions) are likely to affect hydrologic conditions? Please comment on the completeness of the discussion on the relationship between subsurface hydrology and the hydrodynamics of the project area.
17. Was the discussion of natural resources sufficient to characterize current baseline conditions and to allow for evaluation of forecasted conditions (with and without proposed actions)?
18. Were the assumptions used as the basis for developing the most probable future without-project conditions reasonable? Were adequate scenarios effectively considered (applied during analyses where relevant and/or reasonably investigated)?
19. Were the potential effects of climate change on alternatives addressed?
20. Are the future conditions expected to exist in the absence of a Federal project logical and adequately described and documented?
21. Please comment on the conclusion of the most probable future without-project condition. Do you envision other potential probable outcomes?

Plan Formulation/Evaluation

22. Was a reasonably complete array of possible measures considered in the development of alternatives?
23. Did the formulation process follow the requirement to avoid, minimize, and then mitigate adverse impacts on resources?
24. Does each alternative meet the formulation criteria of being effective, efficient, complete, and acceptable? Definitions:
 - Effectiveness – the extent to which the alternative plans contribute to achieve the planning objectives
 - Efficiency – the extent to which an alternative plan is the most cost-effective means of achieving the objectives
 - Completeness – the extent to which the alternative plans provide and account for all necessary investments or other actions to ensure the realization of the planning objectives, including actions by other Federal and non-Federal entities
 - Acceptability – the extent to which the alternative plans are acceptable in terms of applicable laws, regulations, and public policies.
25. Were the assumptions made for use in developing the future with-project conditions for each alternative reasonable? Were adequate scenarios considered? Were the assumptions reasonably consistent across the range of alternatives and/or adequately justified where different?
26. Are the changes between the without- and with-project conditions adequately described for each alternative?

27. Are the uncertainties inherent in our evaluation of benefits, costs, and impacts, and any risk associated with those uncertainties, adequately addressed and described for each alternative?
28. Are future Operation, Maintenance, Repair, Replacement, and Rehabilitation (OMRR&R) efforts adequately described, and are the estimated costs of those efforts reasonable for each alternative?
29. Please comment on the screening of the proposed alternatives. Are the screening criteria appropriate? In your professional opinion, are the results of the screening acceptable? Were any measures or alternatives screened out prematurely?
30. Were the engineering, economic, and environmental analyses used for this study consistent with generally accepted methodologies? Why or why not?
31. Does any alternative include identified separable elements (a portion of a project that is physically separable, and produces hydrologic effects or physical or economic benefits that are separately identifiable from those produced by other portions of the project)? If so, is each identified separable element independently justified, and are the benefits, costs, and effects of the separable elements correctly divided?

Environmental Consequences

32. Are the scope and detail of the potential adverse effects that may arise as a result of project implementation sufficiently described and supported?
33. Have the short- and long-term impacts associated with the alternatives been adequately discussed and evaluated?
34. Are the descriptions of projected impacts on aquatic resources, vegetated resources, water quality and salinity, fisheries, recreation, hydrology, flow and water levels, socioeconomics, cultural resources, and soils and water bottoms for each of the alternatives reasonable and factually supported?
35. Are cumulative impacts adequately described and discussed? If not, please explain.

Tentatively Selected Plan (TSP)

36. Comment on whether you agree or disagree with how the TSP was formulated and selected. Comment on the plan formulation. Does it meet the study objectives and avoid violating the study constraints?
37. Are there any unmitigated environmental impacts not identified and, if so, could they impact plan selection?
38. Please comment on the likelihood of the TSP to achieve the expected outputs.
39. Please comment on the completeness of the TSP; i.e. will any additional efforts, measures, or projects be needed to realize the expected benefits?
40. Please comment on the appropriateness of location, sizing, and design of plan features.

Purpose-Specific Questions

Adaptive Management and Monitoring Plan

41. Are the proposed monitoring procedures clear and appropriate?
42. Is the proposed monitoring plan sufficiently detailed and comprehensive?
43. Are the costs for administering a monitoring and assessment program reasonable?
44. Is adaptive management adequately addressed?

Ecosystem Restoration

45. Are the expected changes in the quality and abundance of desired ecological resources clearly and precisely specified in justifying the ecosystem restoration and protection investment?
 - Is the significance of the desired ecological resources clearly determined by institutionalized national goals (e.g., the Endangered Species Act national goal to sustain native fish and wildlife, the NEPA goal to preserve natural heritage)?
 - Is the scarcity of the desired ecological resources characterized in terms of national abundance and significance (e.g., with indicators of low to high potential for sustainability)?
 - Is the distinctiveness of the desired ecological resources quality indicated (are there closely related resources that substitute in most respects)?
 - Are forecast changes in desired ecological resource quality quantified so as to indicate achievement of national goals?
46. Is it clear that restoration of the desired ecological resource quality is a function of improvements in habitat quality or quantity?
 - Do planning models and procedures clearly link habitat improvements to the needs of the targeted ecological resources?
 - Do planning models and procedures adequately consider and provide for limiting factors beyond quality and quantity of habitat?
47. Is it clear that the restored ecological resource quality will be sustainable over the long run?
 - Are the risks facing successful restoration of sustainable ecological resource quality clearly shown to be managed and are any residual risks identified in terms of:
 - Sufficient geophysical support (hydrology and geomorphology)?
 - Sufficient environmental chemistry?
 - Sufficient biological support (i.e., food, habitat, and systems-stabilizing species)?
 - Changes in climate and in the influential ecoregion (i.e. major land use changes)?
48. Are the required long-term commitments (both Federal and non-Federal) to sustaining the restored ecological resources adequately described and adequately demonstrated?

Engineering

49. Were appropriate engineering solutions (not *engineered* solutions) developed for achieving planning objectives related to ecosystem processes?
50. Are the descriptions of the risk and uncertainties associated with the level of detail in the designs that comprise the TSP sufficiently comprehensive?
51. Were the technical assumptions outlined in the engineering appendix sufficiently comprehensive and conservative for a feasibility study, given the level of design detail?
52. Are the key assumptions used to complete the cost and schedule risk analysis adequate? Is anything missing? In your opinion, do the major findings of the risk analysis provide adequate support for scheduling, budgeting, and project control purposes?

Final Overview Question

53. What is the most important concern you have with the document or its appendices that was not covered in your answers to the questions above?

Overview Questions as Supplied by Battelle

54. Please identify the most critical concerns (up to five) you have with the project and/or review documents. These concerns can be (but do not need to be) new ideas or issues that have not been raised previously.
55. Please provide positive feedback on the project and/or review documents.

Public Comment Questions (provided to the Panel separately for their review of the public comments)

56. Does information provided, or do concerns raised by the public, identify any additional discipline-specific technical issues with regard to the overall report?
57. Has adequate stakeholder involvement occurred to identify issues of interest and solicit feedback from interested parties?

This page is intentionally left blank.

